

UNIVERSITY OF NATAL

PRESERVATION AND ACCESS TO PUBLIC RECORDS AND
ARCHIVES IN SOUTH AFRICA

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PRESERVATION AND ACCESS TO PUBLIC RECORDS AND ARCHIVES IN SOUTH
AFRICA



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SUBMITTED: 3 JULY 2003

DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and has not previously in its entirety, nor in part, been submitted at any university for a degree.

A handwritten signature in black ink, appearing to read 'Patrick Ngulube', is written over a horizontal dotted line.

Patrick Ngulube

3 July 2003

ABSTRACT

This research investigated preservation and access to records and archives in South Africa. Continued access to South African records and archives will largely depend on how records are preserved from creation right through their entire life cycle. The aim of preservation is to prolong the usable life of archives in order to ensure long-term access to them.

The current situation regarding preserving public records and archives and making them available by archival institutions in South Africa was investigated. Based on a questionnaire survey, interviews, observation and content analysis of key documentary sources the factors that affect preservation and access to records and archives were identified. The population of the study were fourteen public archive repositories in South Africa. The units of analysis were the administrative units, that is, the archival repositories rather than the individual survey respondent. The survey data was evaluated and analysed using SPSS®.

The study revealed the inadequate housing and environmental conditions of the archival holdings of the archives repositories surveyed, a lack of awareness concerning preventive preservation measures, inadequate preservation programmes and limited conservation education, lack of reliable data on archival preservation activities, limited resources for conservation activities, and the weak organisational structure and funding of archival institutions in South Africa in general. The study concluded that unless the existing situation is reversed, access to public records and archives in South Africa would diminish.

Although, archival institutions that were surveyed were deeply committed to protecting their holdings for current and future use, they did not uniformly address the preservation challenge. They did not provide total preservation care because the common elements of preservation programmes such as environmental control and monitoring, handling and use of materials, reformatting, disaster preparedness, preservation planning and policies, security, storage of archives and records, treating selected materials, conducting preservation surveys and holding maintenance were addressed in varying degrees by archival repositories in South Africa.

In summary the study's conclusions are that South African archival repositories should allocate more resources to preservation activities, store archival materials under suitable

conditions, comply with agreed standards of preservation and access, use the “least chemical method” when dealing with infestations, provide means of access that minimize the risk of damage, reformat heavily used materials and those in a poor condition, undertake conservation treatment, formulate disaster plans, and preservation and access policies, formulate adequate preservation strategies, research and disseminate information on preservation activities, train and develop staff skills in preservation techniques, collaborate with other heritage institutions in preservation related matters, raise awareness of the importance of preservation and carry out user studies to promote the use of information contained in records and archives.

To improve on the preservation of public records and archives and their accessibility and availability for use, the establishment of a national preservation and access committee under the auspices of the National Archives and Records Service of South Africa was proposed. The committee would aim at:

a) increasing awareness and education of archival professionals and the general public through relevant channels, b) the promotion of the implementation of preservation policies, c) promotion of communication and cooperation at local, national and international level d) addressing national issues such as use of acid-free paper, translation of finding aids into the eleven official languages used in South Africa and use of standards and guidelines, e) initiating research projects, and f) promotion of the creation of conservation and microfilming centres.

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If I have seen farther than other, it is by standing on the shoulders of giants

(Isaac Newton 1643-1727: Acknowledging his debt to Galileo and others)

Like most researchers, I owe more intellectual and personal debts for this thesis's form and content than I can acknowledge or am yet aware of. During the course of my research work and writing of this thesis, a number of individuals and organisations assisted me in various ways. It is impossible to enumerate all of them, but I am particularly indebted to the following people and organisations.

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DEDICATION

For Beatrice and Pamela Tamalia Ngulube

...though for myself alone

I would not be ambitious in my wish
To wish myself much better, yet for you,
I would be trebled twenty times myself.

William Shakespeare (*The Merchant of Venice* Act III, Scene ii)

TABLE OF CONTENTS

DECLARATION	II
ABSTRACT	III
ACKNOWLEDGEMENTS	V
DEDICATION	VI
TABLE OF CONTENTS	VII
LIST OF FIGURES OR ILLUSTRATIONS	XVII
LIST OF TABLES	XVIII
LIST OF APPENDICES	XX
LIST OF ABBREVIATIONS AND ACRONYMS	XXI
CHAPTER ONE: SETTING THE SCENE	1
1.0 INTRODUCTION	1
1.1 BACKGROUND TO STATEMENT OF THE PROBLEM	1
1.1.1 Terms and concepts	6
1.1.1.1 Defining archives and records	6
1.1.1.2 Defining preservation	9
1.1.1.3 Preservation supports access	11
1.1.2 Precursors of the preservation of records and archives	12
1.1.3 Preservation management in South Africa	15
1.2 RESEARCH PROBLEM AND RESEARCH ISSUES	17
1.2.1 Statement of the problem	18
1.2.2 Objectives of the study	19
1.2.3 Research questions	19

1.3 JUSTIFICATION FOR THE RESEARCH	20
1.4 METHODOLOGY	23
1.5 DELIMITATIONS OF SCOPE AND KEY ASSUMPTIONS	24
1.6 ETHICAL CONSIDERATIONS	25
1.7 OUTLINE OF THE THESIS	25
1.7.1 Referencing convention used in the thesis	26
1.8 SUMMARY	27
 CHAPTER TWO: PRESERVATION AND ACCESS TO RECORDS AND ARCHIVES	
WORLDWIDE	29
2.0 INTRODUCTION.....	29
2.1 PURPOSE OF THE LITERATURE IN RESEARCH.....	29
2.1.1 Use of the literature in referencing.....	30
2.1.2 Review of the literature	31
2.1.3 Research map of the literature.....	32
2.1.4 Sources of information	34
2.2 THE RELATIONSHIP BETWEEN PRESERVATION AND ACCESS.....	35
2.3 PARADIGM SHIFT IN THE ROLE OF ARCHIVISTS AND PRESERVATION MANAGEMENT	38
2.3.1 Role of archivists in preservation management	39
2.3.2 Conservation to preservation.....	40
2.4 PRESERVATION OF ARCHIVES AND LIBRARY MATERIALS.....	41
2.5 PRESERVATION OF PAPER-BASED RECORDS AND ARCHIVES.....	43
2.5.1 Acidity	45

2.5.2 Quality of paper for records and archives	48
2.5.3 Restoration and conservation processes	50
2.5.3.1 Deacidification	51
2.5.3.2 Lamination	54
2.5.3.3 Encapsulation	55
2.5.3.4 Microclimates.....	56
2.5.3.5 Conservation and restoration facilities.....	57
2.5.4 Inks and the preservation of paper-based records	58
2.6 PRESERVATION OF VULNERABLE RECORDS AND ARCHIVES	59
2.6.1 Preservation of electronic records.....	59
2.6.2 Issues related to the preservation of digital records and archives	62
2.6.2.1 Preserving access to digital materials.....	62
2.6.2.2 Technological obsolescence.....	63
2.6.2.3 Research	66
2.6.2.4 Training.....	67
2.6.3 Audiovisual records and archives	67
2.6.3.1 Care of photographic materials	69
2.6.3.2 Nature of film and magnetic tape.....	70
2.6.3.3 Effects of environmental factors on audiovisual formats.....	73
2.6.3.4 Storage of films and magnetic tape	74
2.7 PRESERVATION REFORMATTING STRATEGIES.....	77
2.7.1 Photocopying as a preservation strategy	77
2.7.2 Digitisation as a preservation reformatting strategy	78
2.7.3 Microfilming and the preservation of records and archives.....	80
2.8 HANDLING AND CARE	83
2.8.1 Temperature and relative humidity	84
2.8.2 Light	91
2.8.3 Particulate control and gaseous contamination	91
2.8.4 Biological factors	93
2.8.4.1 Silverfish	93
2.8.4.2 Moulds.....	95
2.8.4.3 Other biological enemies of records and archives	96
2.8.4.4 Pest management in records and archives.....	97

2.8.5 Storage of records and archival materials	101
2.8.5.1 Buildings	101
2.8.5.2 Storage equipment.....	104
2.8.6 Handling and good housekeeping	106
2.9 DISASTER PLANNING AND SECURITY OF RECORDS AND ARCHIVES	108
2.9.1 Fire damage	112
2.9.2 Water damage.....	114
2.9.3 Theft and vandalism	115
2.10 PRESERVATION POLICIES	116
2.10.1 Information contained in a preservation policy.....	119
2.11 PRESERVATION PLANNING	120
2.12 PRESERVATION TRAINING AND EDUCATION.....	124
2.12.1 State of preservation training and education in Africa.....	124
2.12.2 Skills and knowledge required for preserving records and archives.....	128
2.13 STANDARDS AND THE PRESERVATION OF PUBLIC RECORDS AND ARCHIVES.....	128
2.14 RAISING AWARENESS OF THE IMPORTANCE OF PRESERVATION	132
2.15 PRESERVATION AND ACCESS TO PUBLIC RECORDS AND ARCHIVES IN AFRICA	133
2.15.1 Preservation challenges.....	133
2.15.2 Access to public records and archives: a historical perspective.....	134
2.16 REVIEW OF PREVIOUS STUDIES ON PRESERVATION AND ACCESS TO RECORDS AND ARCHIVES WORLDWIDE.....	139
2.17 SUMMARY	150

CHAPTER THREE: PRESERVATION AND ACCESS TO PUBLIC RECORDS AND ARCHIVES IN SOUTH AFRICA.....	152
3.0 INTRODUCTION.....	152
3.1 PUBLIC RECORDS AND ARCHIVES MANAGEMENT IN SOUTH AFRICA	152
3.1.1. Mandate of the National Archives and Records Service of South Africa.....	155
3.1.1.1 Records management in South Africa.....	157
3.1.1.2 Management of electronic records in South Africa	159
3.1.1.3 From binding to the preservation of records and archives	162
3.1.2 The National Film, Video and Sound Archives	164
3.1.3 Conditions of records in archives repositories	167
3.2 ARCHIVAL EDUCATION IN SOUTH AFRICA.....	168
3.3 CHALLENGES TO PRESERVING AND ACCESSING RECORDS AND ARCHIVES IN SOUTH AFRICA.....	170
3.3.1 Nature of paper used to create records and archives	171
3.3.2 Environmental control and the management of records and archives	172
3.3.3 Storage of public records and archives in South Africa.....	173
3.3.4 Information technologies and access to records and archives.....	176
3.3.5 Role of legislation in preservation and access to records and archives	177
3.3.5.1 Legal framework for providing access to records and archives in South Africa	178
3.3.5.1.1 <i>Promotion of Access to Information Act 2000 and access to public records in South Africa</i>	179
3.3.5.1.2 <i>National Archives and Records Service of South Africa Act of 1996 and access to public records in South Africa</i>	183
3.3.5.2 Access denied: authority to obtain information is meaningless without means of locating it.....	184
3.3.5.3 Legislation and preservation of records and archives in South Africa	188
3.3.6 Establishing standards	189
3.4 PUBLIC PROGRAMMING	189

3.5 PREVIOUS STUDIES ON PRESERVATION AND ACCESS TO RECORDS AND ARCHIVES IN SOUTH AFRICA.....	191
3.6 SUMMARY	193
CHAPTER FOUR: RESEARCH METHODOLOGY	194
4.0 INTRODUCTION.....	194
4.1 JUSTIFICATION FOR THE PARADIGM AND METHODOLOGY	195
4.1.1 Qualitative-quantitative divide.....	196
4.2 RESEARCH PROCEDURES.....	198
4.2.1 Survey methodology	199
4.2.2 Population.....	201
4.2.3 Reliability and validity in survey measurement.....	203
4.2.4 Questionnaires.....	205
4.2.4.1 Design of the questionnaires, length and layout	207
4.2.4.1.1 <i>Closed questions</i>	208
4.2.4.1.2 <i>Open-ended questions</i>	211
4.2.4.1.3 <i>Length of questionnaires</i>	212
4.2.4.1.4 <i>Layout of questionnaires</i>	214
4.2.5 Pretesting the questionnaires.....	215
4.2.6 Administering the questionnaires.....	217
4.2.6.1 Use of the conventional postal system	217
4.2.6.2 Use of the electronic mail.....	219
4.2.6.3 Response rate to the mailed questionnaires.....	220
4.2.7 Interviews	222
4.2.7.1 Administering interviews	223
4.2.8 Observation	224
4.2.9 Processing and analysis of data.....	226
4.2.9.1 Data evaluation.....	227
4.2.9.2 Data coding	228
4.2.9.3 Content analysis	229

4.2.9.4 Computer processing.....	230
4.2.9.5 Entering data	230
4.2.10 Statistical analysis	231
4.2.10.1 Descriptive statistics.....	232
4.3 ETHICAL CONSIDERATIONS	233
4.4 EVALUATION OF THE RESEARCH METHODOLOGY	235
4.5 SUMMARY	238
CHAPTER FIVE: PRESENTATION OF DATA.....	239
5.0 INTRODUCTION.....	239
5.1 STRATEGIES AND ACTIVITIES FOR PRESERVING PUBLIC RECORDS AND ARCHIVES IN SOUTH AFRICA.....	240
5.1.1 Institutional data and holdings	240
5.1.2 Preservation policies and means	242
5.1.2.1 Preservation expenditure and facilities	244
5.1.3 Standards and the preservation of records and archives	247
5.1.4 Buildings for the storage of archival materials	248
5.1.5 Temperature and relative humidity in archives repositories	249
5.1.6 Light in records and archives storage areas	251
5.1.7 Pest management in an archival environment.....	251
5.1.8 Storage and handling.....	253
5.1.9 Disaster preparedness and security of records and archives	255
5.1.10 State of records and archives in general.....	257
5.2 INFORMATION TECHNOLOGY AND THE PRESERVATION OF RECORDS AND ARCHIVES IN SOUTH AFRICA.....	261
5.3 LEVEL OF SKILLS AND KNOWLEDGE IN PRESERVING RECORDS AND ARCHIVES AND MAKING THEM AVAILABLE FOR USE	264

5.4 ACCESS TO INFORMATION CONTAINED IN RECORDS AND ARCHIVES.....	270
5.4.1 Access tools and finding aids.....	271
5.4.2 Users and the accessibility of records and archives.....	272
5.4.3 Public programming.....	274
5.4.4 Priorities for improving the management of records and archives and making them available for use.....	276
5.4.5 Information technology and access to records and archives in South Africa.....	277
5.5 LEGAL SITUATION RELATED TO THE PRESERVATION OF RECORDS AND ARCHIVES IN SOUTH AFRICA.....	278
5.7 SUMMARY.....	279
CHAPTER SIX: INTERPRETATION OF THE RESULTS.....	282
6.0 INTRODUCTION.....	282
6.1 PATTERNS OF DATA FOR EACH RESEARCH ISSUE.....	283
6.1.1 Strategies used in the preservation of records and archives in South Africa.....	283
6.1.1.1 Archival infrastructure for the preservation of records and archives.....	284
6.1.1.2 Preservation policies and means.....	284
6.1.1.3 Environmental control and pest management.....	289
6.1.1.3.1 Archival buildings: the first line of defence.....	289
6.1.1.3.2 Temperature and relative humidity in the storage environment.....	291
6.1.1.3.3 Light in the storage environment.....	293
6.1.1.3.4 Pest management in the archival environment.....	294
6.1.1.3.5 Handling and care of archival holdings.....	296
6.1.1.4 Disaster preparedness and security management in archival repositories.....	299
6.1.1.5 Strategies and activities for preserving audiovisual formats in South Africa.....	301
6.1.1.6 State of the records in archival repositories.....	303
6.1.1.7 Standards for preserving and making records and archives available for use.....	305
6.1.2 Legal situation related to the preservation and access to records and archives.....	308
6.1.3 Information technology and the preservation of records and archives.....	311
6.1.4 Level of skills and experience in preservation management in South Africa.....	315

6.1.5 Information technology and access to public records and archives in South Africa	318
6.1.6 Steps that have been undertaken to safeguard records and archives	321
6.1.7 Access to information contained in public records and archives	322
6.2 SUMMARY	327
 CHAPTER SEVEN: SUMMARY OF STUDY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	
	331
7.0 INTRODUCTION.....	331
7.1 SUMMARY OF THE STUDY FINDINGS	331
7.2 CONCLUSIONS ABOUT RESEARCH ISSUES.....	335
7.2.1 Conclusions about activities and strategies used in the preservation of records and archives in South Africa.....	336
7.2.2 Conclusions about means and processes employed to make information contained in records and archives accessible.....	337
7.2.3 Conclusions about the legal situation related to the preservation of, and access to records and archives.....	338
7.2.4 Conclusion about the impact of information technology on the preservation of, and access to records and archives.....	339
7.2.5 Conclusions about skills and experience in preservation management	340
7.2.6 Conclusions about steps that have been undertaken to safeguard records and archives	340
7.3 CONCLUSIONS ABOUT THE RESEARCH PROBLEM.....	341
7.4 RECOMMENDATIONS	342
7.4.1 Recommendations for activities and strategies used in the preservation of records and archives in South Africa	343
7.4.2 Recommendations for the legal situation related to the preservation of records and archives and making them accessible.....	346
7.4.3 Recommendations to address the impact of information technology on the preservation of, and access to records and archives.....	348

7.4.4 Recommendations for means and processes employed to make information contained in records and archives accessible.....	349
7.4.5 Recommendations for skills and experience in preservation management.....	349
7.4.6 Recommendations on some steps to safeguard records and archives	350
7.5 IMPLICATIONS FOR THEORY.....	350
7.6 IMPLICATIONS FOR POLICY AND PRACTICE	351
7.7 FURTHER RESEARCH.....	352
7.8 IN CONCLUSION.....	354
LIST OF REFERENCES	356
APPENDICES.....	410

LIST OF FIGURES OR ILLUSTRATIONS

Figure 1: Research map of the literature	33
Figure 2: Sample Preservation Calculator.....	89
Figure 3: Organisational structure of the National Archives and Records Service of South Africa.....	156
Figure 4: Number of institutions with a written preservation policy	243
Figure 5: Preservation options used by archival institutions in South Africa.....	245
Figure 6: Standards set by NARSA for archival repositories	248
Figure 7: Checking materials before accessioning them.....	252
Figure 8: Frequency of cleaning records storage area expressed as a percentage	253
Figure 9: Records and archives storage equipment expressed as a percentage	254
Figure 10: Distance of records from the floor expressed as a percentage.....	256
Figure 11: Damage caused to records expressed as a percentage	258
Figure 12: Available knowledge of digital preservation expressed as percentage	264
Figure 13: Level of expertise in dealing with selected preservation activities	267
Figure 14: Additional training needs identified by respondents expressed as a percentage ...	268
Figure 15: Level of additional training needed by staff expressed as a percentage.....	269
Figure 16: Training method preferred by the respondents.....	270
Figure 17: Equipment for making records and archives accessible	273
Figure 18: Top eleven priorities for improving the management of archives and records and making them available for use identified by the respondents	277

LIST OF TABLES

Table 1: Selected features of ISI ResearchSoft™ bibliographic products.....	31
Table 2: Instruments for measuring relative humidity (RH) and temperature.....	88
Table 3: Temperature and relative humidity ranges in selected towns in South Africa	172
Table 4: Sample of readings from the Preservation Calculator for selected towns in South Africa.....	173
Table 5: An overview of repository storage space at archival institutions in South Africa....	175
Table 6: Number of reading room visitors to NARSA since the passage of the National Archives Act of 1996	190
Table 7: Use of different research strategies.....	198
Table 8: Steps for administering and following up questionnaires.....	218
Table 9: Types of records held in archival repositories in South Africa.....	241
Table 10: Name of document containing mission statement	242
Table 11: Policies to deal with preservation matters.....	243
Table 12: Annual spending for archival programmes.....	244
Table 13: Co-operative preservation activities with national, regional and international institutions.....	246
Table 14: Ranking of the successfulness of preservation programmes	246
Table 15: Proximity of archival building to hazardous environments.....	249
Table 16: Average temperature inside and outside the buildings and repositories.....	250
Table 17: Frequency of exterminating vermin infestations	252
Table 18: Aspects covered by the disaster preparedness plans.....	255
Table 19: Classes of records in particularly poor condition.....	258
Table 20: General physical condition of records and archives in archival institutions.....	259
Table 21: Summated scales on the attitude of the respondents towards the condition of their records and archives	260
Table 22: Ranking of factors that were regarded as threats to digital materials at archival institutions within the next five years	263
Table 23: Intended methods of enhancing staff expertise in digital preservation.....	264
Table 24: Categories and qualification of staff employed in the preservation and conservation of public records and archives in South Africa	265

Table 25: Type of training for personnel directly involved in preservation and conservation activities	266
Table 26: Expertise in dealing with some selected preservation activities	267
Table 27: Level of additional training needed by staff at responding archival institutions	269
Table 28: Best methods for receiving additional training cited by the respondents	270
Table 29: Tools used to locate descriptions of records and archives	271
Table 30: Significant impediments to the use of records and archives	272
Table 31: Number of research requests received each year by all repositories	272
Table 32: Comparisons of trends of visitors to reading rooms in Botswana, Malawi, Swaziland, Zimbabwe and South Africa.....	275
Table 33: Strategies used in public programming activities	275
Table 34: Priorities for improving the management of archives and records and making them available for use identified by the respondents	276
Table 35: Information offered by archival institutions over the Internet.....	278

LIST OF APPENDICES

Appendix 1: List of postal and street addresses of public records and archives repositories in South Africa	410
Appendix 2: Map showing the nine provinces of South Africa	413
Appendix 3: Covering letter for pretesting the questionnaires	414
Appendix 4: Covering letter for the survey instrument for collecting information on preservation of, and access to public records and archives in South Africa	416
Appendix 5: Survey instrument for collecting information on the preservation of, and access to public records and archives in South Africa	417
Appendix 6: Covering letter for the survey instrument for collecting information on the preservation of, and access to audiovisual records and archives in South Africa.....	444
Appendix 7: Survey instrument for collecting information on the preservation of audiovisual records and archives in South Africa	445
Appendix 8: Observation schedule used at selected archival repositories.....	462
Appendix 9: Reminder letter to respondents.....	463
Appendix 10: Basic skills and experience needed for preservationists (conservators).....	464
Appendix 11: Extracts from the National Archives of South Africa Act, 1996 as amended..	465
Appendix 12: Extracts from the Promotion of Access to Information Act, 2000.....	467
Appendix 13: National Archives and Records Service of South Africa Regulations (R1458, 2002.11.20).....	471
Appendix 14: Selected standards applicable to the preservation of records and archives.....	476
Appendix 15: Planning activities in the preservation of archival materials.....	477
Appendix 16: Simplified deacidification procedure	478

LIST OF ABBREVIATIONS AND ACRONYMS

- ACARM: Association of Commonwealth Archivists and Records Managers.
- ACTAG: Arts and Culture Task Group.
- ALA: American Library Association.
- AMLIB: Association for Archivists and Manuscript Librarians.
- ANSI/NISO: American National Standards Institute and National Information Standards Organization.
- ASCII: American Standard Code for Information Interchange.
- AV: Audiovisual.
- BBC: British Broadcasting Corporation.
- BS5454: Recommendations for the storage and exhibition of archival documents (British National Standard).
- °C: Degrees Celsius.
- CA: Controlled atmospheres.
- CAN: Conservation Administration News (periodical).
- CCTV: Closed circuit television cameras.
- COSHRC: Council of State Historical Records Coordinators (USA).
- CSIR: Council for Scientific and Industrial Research.
- CTMP: Chemi-thermomechanical Pulp.
- DACST: Department of Arts, Culture, Science and Technology.
- DEZ: Diethyl Zinc.
- E-mail: Electronic mail.
- E-records: Electronic records.
- ESARBICA: Eastern and Southern Africa Regional Branch of the International Council on Archives.
- ETO: Ethylene oxide.
- °F: Degrees Fahrenheit.
- FIAF: International Federation of Film Archives.
- FTE: Full Time Equivalence.
- FOI: Freedom of Information.
- HTML: Hyper Text Markup Language.
- HTTP: Hyper Text Transport Protocol.

HVAC: Heating, Ventilation and Air-conditioning System.

ICA: International Council on Archives.

ICTs: Information and Communication Technologies.

IFLA: International Federation of Library Associations and Institutions.

IDG: Internet Discussion Groups.

IEE: Institution of Electrical Engineers.

IPI: Image Permanence Institute.

IPM: Integrated Pest Management.

IRMT: International Records Management Trust.

ISAD (G) General International Standard Archival Description.

ISI: Institute of Scientific Information.

ISO: International Organization for Standardization.

ISO/TC 46: International Organization for Standardization/Technical Committee 46.

JICPA: Joint IFLA/ICA Committee on Preservation in Africa.

LIS: Library and Information Services.

MA: Modified Atmospheres.

MBLC: Massachusetts Board of Library Commissioners.

MIT: MIT Fold Endurance Test developed at the Massachusetts Institute of Technology (MIT).

NAAIRS: National Automated Archival Information Retrieval System.

NAGARA: National Association of Government Archives and Records Administrators.

NARA: National Archives and Records Administration.

NAREM: National Register of Manuscripts.

NARSA: National Archives and Records Service of South Africa.

ND: Not Dated.

NEDCC: Northeast Document Conservation Center.

NFA: National Film Archives.

NFVSA: National Film, Video and Sound Archives.

NPO: National Preservation Office (UK).

PAIA: Promotion of Access to Information Act.

PAMSA: Paper Manufacturers Association of South Africa.

PERT: Program Evaluation and Review Technique.

PDF: Portable Document Format.

pH: Potential of hydrogen, which is the degree of acidity and/or alkalinity.

PI: Preservation Index.

RAIMAZ: Records, Archives and Information Management of Zimbabwe.

RAMP: Records and Archives Management Programme.

RH: Relative Humidity.

SABS: South African Bureau of Standards.

SAFI: South African Film Institute.

SAHA: South African History Archive.

SAHRC: South African Human Rights Commission.

SAPCON: South African Preservation and Paper Conservation Group.

SAQA: South African Qualification Authority.

SGML: Standardized General Markup Language.

SITA: State Information Technology Agency.

SPSS: SPSS Inc.

SSA: Sub Saharan Africa.

TDM: Total Design Method.

TRC: Truth and Reconciliation Commission of South Africa.

TSP: Total Suspended Particules.

UK: United Kingdom.

URL: Uniform Resources Locator.

US(A): United States of America.

UNESCO: United Nations Educational, Scientific and Cultural Organisation.

UV: Ultraviolet.

WAAC: Western Association for Art Conservation.

WWW: World Wide Web.

XML: Extensible Markup Language.

CHAPTER ONE: SETTING THE SCENE

Who controls the past controls the future.

Who controls the present controls the past.

(Orwell 1965:38)

1.0 INTRODUCTION

Most of humankind's documentary heritage is recorded on materials that are subject to the ravages of unstable environments, biological factors, careless handling, natural and human-made disasters, inferior paper, impermanent and acidic inks, and technological obsolescence resulting from outdated hardware and software formats that render information inaccessible. Preservation, as a collection management strategy is key to long-term access to records and archives. By guaranteeing continued access to records and archives, "preservation allows for the continuity of the past with the present and the future" (Cloonan 2001:235). The quotation from George Orwell provides an appropriate backdrop against which to discuss the importance of preserving records and archives.

The preservation of records and archives facilitates continuity in decision-making as well as providing evidence of past activities and historical precedence for future generations. Records and archives help to "establish communications between the past and future generations" (Van Albada 2001:39). Without records and archives it would be difficult for people to learn from past successes or failures. The society's ability to be well informed would be accordingly limited. Without records and archives we cannot fully explain the ever-changing present and inform the future with wisdom. In a nutshell, archives and archivists are the guardians of "the continuity with the previous and future generations of our nations" (Van Albada 2001:39).

1.1 BACKGROUND TO STATEMENT OF THE PROBLEM

With the end of apartheid¹ and the abolition of the previous laws that restricted access to archives and public records to a few privileged people one would have imagined that the problem of accessing information contained in public records and archives had been put to

¹ Apartheid means "apartness". Apartheid was the policy of racial segregation implemented by the white minority government of South Africa from 1948 to 1991.

rest. On the contrary, the change towards openness did not totally solve the problem of access to information. Ultimately, if records and archives are not preserved they will not be accessible in the long run. Preservation is critical to the future of archives and key to the archivist's ability to facilitate long-term continuing access. Preservation procedures in records and archives entail the acquisition, organisation and distribution of human, physical and financial resources in order to maintain materials in a usable state (Conway 1990:206). Preservation techniques encompass planning and implementing procedures that prevent deterioration of records and archives.

Access to and preservation of public records and archives should be the main target of preservation efforts because it is apparent that government is the largest producer and user of information (Blunt 1995:7; Evans, Amodeo & Carter 1999:393; Heeks 2000:197). At this juncture one may ask the question that was posed in 1947 by Sir Hilary Jenkinson, one of the most eminent archivists: "Why all this fuss about archives?" (Jenkinson 1947:236). Archives in general and public records and archives in particular, pertain to legal, social, political and economic rights of individuals. They enshrine the individual's legal and moral rights. They also provide the evidence on which the integrity and judgement of governments can be vouched for or called into question.

Without records and archives, governments and organizations are incapable of effectively managing current operations, and have little ability to use the experience of the past for guidance. Records are inextricably entwined with increased transparency, accountability and good governance. Without the preservation of records and archives, it is difficult if not impossible to hold government accountable. In fact, public records and archives are key to accountability and good governance because they reflect government's functions, activities, procedures, and the administrative processes that generate them; as well as the facts, acts, and transactions attested to them. Records and archives can effectively play the foregoing outlined role if they are appropriately preserved and made accessible when required.

Records and archives must be preserved because their format, the environment in which they are kept, disasters, and the way they are handled and used threatens humankind's ability to access the information they contain (Adcock. n. d; Feather 1991:32; Jones & Ritzenthaler

1988:189-190; Swartzburg 1995:6; UNESCO 2000). In practice, that means maintenance, examination, conservation and restoration are critical to the preservation of archives and records. At a more mundane level, archival preservation management is concerned with the conditions of records and archives and how they are stored and used.

It appears that little attention is being paid to preservation as a collection management strategy. Mazikana (1999:78) observed that many of the countries in southern Africa use records management systems that are grossly antiquated and inefficient. The remark still applies today where one finds piles of disorganised records in most government registries and records offices. Access to the records is severely handicapped because of poor collection management policies.

Collection management strategies include acquisition, arrangement, description, preservation, access and promotion of documentary materials (Bonita 1989; Clayton & Gorman 2001:17; Feather 1991:76; Jenkins & Morley 1999:2; Walters 1998:159). The ultimate objectives of collection management strategies are to provide access and by implication usage. One of the strategies of ensuring continued access to records and archives is preservation (Jones and Ritzenthaler 1988:185). Preservation is one of the vital sub-domains of information science (Feather & Sturges 1997:x).

Furthermore, Jones and Ritzenthaler (1988:185) and Millar (1997:63) identified preservation as one of the key activities and defining concepts of archival management. In essence, archivists are preservers, for as Schellenberg (1971) pointed out, "... the end of all archival effort is to preserve valuable records and make them available for use. Everything an archivist does is concentrated on this dual objective" (Schellenberg 1971:224). Unfortunately, preservation management does not appear to occupy the centre stage in developing countries. Thus, it has been observed by Duchein (1983:1) that in developing countries access to and use of records and archives should, "begin with their safeguarding". Dadzié's statement made in 1966 at the Extraordinary International Congress on Archives held in Washington, though now outdated still rings true: very little attention is being given to safeguarding records and archives through promoting preservation (Duchein 1983:1).

In fact, the situation is steadily growing worse as the infrastructures in many countries in Sub Saharan Africa (SSA) have disintegrated with air-conditioners and conservation and reprographic equipment having become non-functional (Mazikana 1992; ESARBICA 2001). On the basis of personal observations, surveys and reports from consultants, like Mazikana (1992) and Alegbeleye (1999:1) one could dare to argue that the preservation and conservation scene in Africa is in a dismal state.

Preservation should be part of collection management strategies in SSA because it supports current and future access to recorded information. It is surprising that until recently, “the practical aspects of archival preservation have drifted in and out of archival priorities...”(Kaplan & Banks 1990:266). As a result, records and archives are in grave danger of being lost and becoming inaccessible.

Preservation and access are mutually reinforcing ideas because preservation action is taken on an item so that it may be used (Conway 1999; Swartzburg 1995:25). The assumption is that access facilitates the use of records and archives. Continued access to public records and archives in South Africa will largely depend on how they are preserved from creation right through their entire life cycle. For public records and archives to serve their purpose in terms of providing evidence of actions and activities, ensuring accountability and good governance, and serving as the corporate and societal memory, they should be preserved.

Utilisation of knowledge stored in public records and archives depends on their accessibility. Essentially, the utilisation of knowledge “is the core of information science and information work” (De Beer 1999:13). Knowledge has been defined as an integrated body of information on a subject (Marais 1996:213). Therefore, without preservation management, current and future access to knowledge codified in public records and archives cannot be guaranteed.

Despite the fact that preservation as part of collection management strategies can prolong the usable life of public records and archives and ensure long-term access to them, very little attention has been paid to the issue in Sub Saharan Africa. Little empirical research, if at all, has been conducted on preservation management. According to Rosenberg (1995) and Mazikana (1992; 1995) very few studies have focused on preservation in Africa. Some of the

few studies that have been identified are those of Chida (1994), Kemoni (1996), Matwale (1995), Murray (2002) and Peters (1998). The paucity of preservation studies in Africa was also confirmed by the annotated bibliography compiled by McIlwaine (1996) that has very few entries focusing on preservation in Africa. The most recent bibliographies compiled by Alegbeleye (2000) and the National Archives of the Netherlands and others (2001) also confirm the paucity of literature on preservation management in Africa.

A number of studies on preservation have been done in Europe and the United States of America (Conway 1991; Feather & Eden 1997; Lowell 1986). These studies are discussed in more detail in section 2.16 of Chapter Two. While contributions from outside Africa are acknowledged, we need to ask how and to what extent should Africa's preservation activities be rooted in African realities or shaped by trends in Europe and the United States of America. We need to understand the appropriateness and limitations of European and American preservation initiatives and adapt the ones applicable to the African context.

The western preservationists and conservators have started to realize that the problems faced in other parts of the world are different and "often more complex than their own" (The National Archives of the Netherlands *et al.* 2001:49). That in itself, underscores the fact that preservation needs vary from one environment to another (Chapman 1990). Therefore, studies on preservation relevant to specific environments are very crucial. Moreover, Porck and Teygeler (2000) pointed out that preservation research should focus on understanding typical non-western preservation and conservation problems. Rhys-Lewis (1999:167) has criticised over - dependency on imported preservation solutions by developing countries and advocated the creation of a "culture of local problem-solving". To Rhys-Lewis (1999:166) "the preservation of archives and their conservation in developing countries can only be attempted if the problems are understood".

Empirical research largely provides objective means for critically evaluating and contextualizing the theories and concepts constructed outside Africa as well as understanding the preservation problems that the continent is facing. According to the National Archives of the Netherlands and others (2001:52), empirical research "can give worthwhile insight to the conservation needs of national archives" in the developing world.

Research into preservation can lead to a better understanding of preservation issues facing the developing nations as well as providing solutions to what is to be done, and how resources should be used. Research is going to yield data for use in decision-making. In order to effectively address preservation problems, archivists in Africa need to collect data that could be used to plan and implement preservation programmes. On the basis of the data, they would be able to judiciously allocate the available resources.

Without adequate information, scarce resources may be expended on projects that do not reflect the greatest preservation need. Planning at a national level is necessary if the availability and access to archives is to be ensured. Formulating policies and plans depend on the availability of information for decision-making, unfortunately in the context of Africa, such information is lacking.

1.1.1 Terms and concepts

The key terms and concepts are explained in this section to provide the context in which they are used as well as ensuring that they are appropriately used for the design and actual collection of data. Choosing a nomenclature and fixing definitions will provide the author and future investigators with means of assessment while at the same time allowing them to operate with the same meanings of terms. Firestone (1987) argued that, defining terms also adds precision to a scientific study. In fact, the power of words like symbols comes from, “the combination of meaning in a specific setting . . . Scientific language ostensibly strips this multiplicity of meaning from words in the interest of precision (Firestone 1987:17).

1.1.1.1 Defining archives and records

The review of literature on the definitions of archives and preservation seem to confirm the conclusions of Firestone (1987). The definition of archives is greatly contested. For instance, in the information technology context archiving means saving data or information on a diskette or creating some form of back-up storage for a short or long period, whereas archiving in the framework of archival science has an element of long and short term retention of information (Hunter1997:1).

In Europe there is no differentiation between archives and records whereas the two terms do not mean the same thing in the United States of America and Canada (Duchein 1983:1; Evans, Harrison & Thompson 1974:417). To most European countries with some long-standing archives tradition the English word archives, which is, for example, *archiv* in German, *archivo* in Spanish, *archivio* in Italian and *архив* in Russian refers to all documents, whatever their age or format, that are produced or received by individuals or organizations in the performance of their activities (Duchein 1983:1; UNESCO quoted in Couture & Rousseau 1987:23).

However, in the United States archives are defined as non-current records preserved because of their continuing or enduring value (Evans, Harrison & Thompson 1974:417; Couture & Rousseau 1987:236; Duchein 1983:1; Hunter1997:2). According to the National Archives of South Africa Act No.43 of 1996 as amended, “archives are records in the custody of an archives repository” (South Africa 1996b).² Archives, in the South African context, are records that have been deposited into an archives repository irrespective of their provenance.

Be that as it may, the debate seems to revolve around whether or not records and archives are the same. The undisputed fact is that records are recorded information regardless of form or medium, created or received and accumulated by a person or organization in the course of the conduct of normal business (Charman 1990; Diamond 1995:1; Duchein 1983:1; Evans, Harrison & Thompson 1974:427; Penn, Pennix & Coulson 1994:5; Robek, Brown & Stephens 1995:5; Walne 1984:137). The form on which the recording of information is done may be paper, microfilm, audiotapes, videotapes, photographs, slides, or any computer-readable medium such as computer tapes or disks, compact disks, optical disks.

Records can be divided into three categories depending on the stage they would have reached in the records life cycle. Firstly, when records are used regularly for the conduct of current business they are said to be active or current. Current records are generally maintained in or near their places of creation or in a registry or records office. A registry is the control centre of

² The Cultural Laws Amendment Act, No. 36 of 2001 changed the title of the National Archives of South Africa Act to National Archives and Records Service of South Africa Act, 1996. The Act also repealed the National Archives Regulations of 1997.

all records coming into and leaving an organisation (Botswana 1993:1). The files and other records of an organisation are created, processed, distributed, kept, retrieved and disposed of in the registry. Secondly, when records are utilized infrequently in carrying out administrative work they are referred to as semi-current or semi-active records. Semi-current records are normally transferred from current records systems to a records centre or other offsite intermediate storage place.

Records centres are designed for the low-cost storage, maintenance and use of semi-current records pending their ultimate disposal. There comes a stage when records stored at the records centre become non-current or inactive. In the final analysis, non-current or inactive records are either destroyed or transferred to the archives, as they would be no longer needed for conducting current business. In that sense, the records centre is an intermediate stage between the registry or records offices and archival institutions. Once non-current records are transferred to an archival institution they become archives.

Archives have been defined differently in terms of the materials, that is, records; facilities where they are kept or archives repository; and institutions concerned with their acquisition, preservation and communication (Hunter 1997:2; Smith 1987:357; Walne 1984:25). For the purpose of this study, archives are defined as non-current records that have been selected for permanent preservation and have been transferred from current or semi-current records storage facilities to a building or institution where they are preserved and utilized.

Furthermore, archives can be delineated according to provenance or origin. Except in a few countries and the United States in particular, where there is a distinction between archives and historical manuscripts (Hunter 1997:3; Schellenberg 1965:x), archives are designated as either public or non public (Duchain 1983:1; South Africa 1996b). In some countries, historical manuscripts are records emanating from non-governmental organisations and individuals. On the other hand, public records and archives are documents of public origin created by public funds (Schellenberg 1971:3). Likewise, the National Archives of South Africa Act No.43 of 1996, as amended, defines public records as records created or received by a governmental body in the conduct of its business (South Africa 1996b). In this study any reference made to archives and records pertains to records and archives of public origin. For readability and

convenience, the term “public” is often dropped throughout this study. However, the term is used whenever necessary.

1.1.1.2 Defining preservation

The concept of preservation is also not clear in the perceptions of scholars. For example, preservation is used in some cases as an umbrella term to refer to activities that prolong the life of documentary materials, and conservation to refer to the physical and chemical treatment of individual materials. This perception was once a subject of a heated debate between Darling (1985) and McColgin (1985). McColgin (1985) took exception to the use of preservation as an umbrella term to refer to all activities that prolong the life of information contained in documents while Darling (1985) advocated the use of preservation as an embracing term for all the preservation and conservation processes. Wright (1990:317-319) pointed out that conservation is still the preferred broader term in Canada, and ‘conservation treatment’ is used to refer to changes brought about through physical or chemical treatment. For quite some time preservation and conservation have been used synonymously (Conway 1990:207; Kenney 1990:184; Wedgeworth 1993:224) though there is now agreement that the umbrella term is preservation and not the latter (Ogden 1999).

The misconception surrounding the usage of preservation and conservation is also manifested in recent literature. For instance, recently Millar (1997:73) still referred to preservation as a process that constitutes “technical activities that physically change documents” *per se*. Some scholars like Kenney (1990:184) and Swartzburg (1995:262) have argued that what Millar (1997:73) refers to, as preservation is in effect conservation. Conservation techniques that physically change documents are lamination, preservation microfilming and digitisation. These activities constitute aspects of preservation. It is now generally accepted that conservation is an aspect of preservation management concerned with the chemical or physical treatment of materials (Kenney 1990:184; Morrow & Dyal 1986:2; Swartzburg 1995:262).

The emerging consensus defines preservation as a range of activities associated with maintaining materials in a usable state, either in their original physical form or in some other usable way (Bellardo and Bellardo 1992:26-27; Conway 1990:206-207; Evans, Harrison &

Thompson 1974:427; Feather & Sturges 1997:371; Hunter 1997:152; Kenney 1990:184; National Preservation Office 1992; Ritzenthaler 1993:1-2; The National Archives of the Netherlands *et al.* 2001; Walne 1984:129). It was in this light that in 1996 the International Association of Library Associations and Institutions (IFLA) Section on Conservation changed its name to the IFLA Section on Preservation and Conservation to reflect the range of all activities pertaining to preservation (Manning 2000:13).

The main activities associated with the preservation of records and archives in a usable form are: maintenance, examination, conservation and restoration. The activities are undertaken to physically protect and “defend” records and archives (Jenkinson 1937:44). This study subscribes to the view that preservation pertains to allocating resources, and planning and implementing policies, procedures and processes comprising maintenance, examination, conservation and restoration in order to ensure adequate protection of documents. The preliminary procedure taken to determine the structure of the materials and the extent of deterioration, alteration and loss is called examination (Swartzburg 1995:271).

Conservation, the function mostly associated with preservation, is really only a small part of the picture as discussed above. Restoration entails specific measures undertaken to return records and archives as closely as possible to their original condition (Swartzburg 1995:271).

Maintenance refers to the daily care of records and archives. Maintenance protects records against environmental hazards or other physical dangers, like media instability and fragility. In addition, maintenance also encompasses other elements of preservation (Jones & Ritzenthaler 1988:196) such as environmental control; disaster preparedness; preservation microfilming and reformatting; data migration; handling and use policies and conservation treatment.

Preservation has two elements, namely, preventive and remedial or renewal (Child 1999a; Conway 1990:207). Preventive preservation seeks to reduce the risks of damage and the rate of deterioration by selecting durable materials, providing favourable storage environments and safe handling procedures. Maintenance and examination are the preservation management activities closely linked to preventative measures. Accordingly preventive preservation plays

much the same role with respect to records and archival materials, as do public health and preventive medicine for people.

On the other hand, remedial preservation involves the physical and chemical protection of records and archives. Remedial preservation is characterised by conservation and restoration. Emphasis should be placed more on preventive preservation than remedial preservation (Chapman 1990:2; Jones & Ritzenthaler 1988:188; UNESCO 2000) because the former is less expensive than the latter. In fact, remedial preservation is not cost-effective as it entails intervention when materials have already deteriorated. It involves costly procedures such as treatment and reformatting.

1.1.1.3 Preservation supports access

Preservation activities facilitate continued availability and access to public records and archives. Public archives and records belong to the public, so they must be accessible as evidence for decisions and actions for which governments are accountable to citizens. According to Guercio (2001:244):

The principal role of the record is, in fact, that of rendering the act or fact, which is the subject of the record in its original administrative context, accessible and knowable across time and space.

The need to make records and archives “accessible and knowable across time and space” is reason enough to necessitate research into their protection and to justify investment of public money into their preservation. Some preservationists have argued that preservation is access (Battin 1993:367; Graf 2000:17; Shoaf 1996:224). From the point of view of the three experts, access to archives and records is not possible without preservation in as much as preservation should be focused on providing access and not being just an end in itself. Essentially, if archives and records are created, then neglected, they will not be available for present and future generations. Access to records and archives justifies preservation. Access for current and future users is a primary motive for preservation.

Access refers to the availability, ability and opportunity to consult records and archives (Couture & Rousseau 1987:233; Walne 1984:15). In other words, access includes both the

legal right of access and the means of arrangement and description that enable users to examine and study individual records and archives (Smith 1987:355). Ultimately, access to records and archival information resources will largely depend on the integration of preservation into records and archives collection management activities. Consequently, preservation of records and archives to promote access has been one of the main concerns of humankind throughout many generations, as will be demonstrated presently.

1.1.2 Precursors of the preservation of records and archives

The concept of preserving records and archives is not new. Keeping records and archives was one of the main activities of ancient Sumerian, Graeco-Roman and Egyptian societies (Penn, Pennix & Coulson 1994:4; Schellenberg 1971:1). Likewise, the Israelites preserved records and archives during the time of Zedekia (598-587 BC). In fact, the prophet Jeremiah in the Bible underscored the importance of preserving records and archives for future use (Jeremiah buys a field 1976). Handing over his title deeds to Baruch for safekeeping Jeremiah said:

The Lord Almighty, the God of Israel, has ordered you to take these deeds, both the sealed deed of purchase and the open copy, and to place them in a clay jar, so that they may be preserved for years to come (Jeremiah 32 verse 14).

Similarly, in the sixth century, the Roman Emperor Caesar Flavius Justinianus issued a decree for the preservation of records and archives. He ordered all provinces to allocate a public building for preserving records and archives so that they remained uncorrupted and accessible (quoted in Schellenberg 1971).

However, the management of public records and archives only became very important after the French Revolution. It was the French Revolution, which by its Archives Act of 1794 launched the modern era in the history of archives where they are seen as ‘arsenals of history’ (Huiling 1996:215; Posner 1967:25-26). The French Revolution led to the establishment of the first modern archives in the world, as well as giving the concept of public access to records and archives its first legislative form (Higgs 1996:137). The French Revolution also established the principles of national archives and rekindled the Greek concept of the accessibility of records and archives to the public (Couture & Rousseau 1987:22; Jo Pugh 1992:5; O’Toole 1990:29; Posner 1967:25-26). For the first time in history, the state became

obliged to preserve records and archives for the sake its citizens. As a result the responsibility of the state for the care of valuable documents of the past was formally acknowledged (Posner 1967:25-26; Schellenberg 1971:5). The French example has been followed by most nations all over the world.

The ideas that emanated from the French Revolution have continued to define the care of the documentary heritage of nations the world over. This explains why most governments recognize records as a tool for improving governmental efficiency as well as preserving the national memory and cultural heritage. For instance, it is no wonder that the National Archives of South Africa Act No. 43 of 1996 (South Africa 1996b) and KwaZulu-Natal Archives Act No.5 of 2000 (KwaZulu-Natal 2000) provide for the proper management and care of the records of governmental bodies; and their preservation and use.

The promotion of access to public information was another innovation of the French Revolution (Duchein 1983:10; Posner 1967:26). Article 37 of the Messidor decree of 24 April 1796 proclaimed that, every citizen was “entitled to ask in every depository ... for the production of the documents it contains” (Posner 1967:26). In recognition of the notion of the “right to information”, the United Nations embodied the concept in the Universal Declaration of Human Rights in 1948. Consequently, many governments have embraced the principle of public access to information. For instance, according to section 3(b) of the National Archives of South Africa Act of 1996 as amended, one of the objectives of the National Archives and Records Service of South Africa is to make records and archives accessible and promote their use.

Many democracies in the world have passed Freedom of Information (FOI) legislation to promote public access to recorded information. In line with the trend towards “open democracy” South Africa has also passed the Promotion of Access to Information Act (PAIA) No. 2 of 2000 to provide for the constitutional right of access to any information held by the state and any information that is held by another person and that is required for the exercise or protection of any rights (South Africa 2000).

Access to public records and archives in South Africa is no longer considered a privilege, nor a service demanded by historians and other social scientists for their research, but a right guaranteed by the law for all citizens. This development would facilitate easy and perhaps, increased access to records and archives. The potential implications for preservation of the PAIA are discussed in greater detail in section 3.3 of Chapter Three.

Promotion of access to information and technological change are the two major recent developments that have made preservation a central issue in the management of records and archives. On one hand, promotion of access means that the rate of handling and use of the documents will increase. Handling and use lead to actual breaking, tearing or dirty smudges. The questions that arise for the custodians of records and archives are: How can documents be made available without damaging them? How can documents be preserved whilst being used? (UNESCO 2000). A long-term preservation policy that aims at preventing, stopping or slowing down the deterioration of the documents as well as creating surrogate documents seems to provide some answers to these questions.

In addition to the overwhelming problem of reconciling access to, and deterioration of materials, the increasing use of digital technology by government departments requires a reassessment of policies developed for the storage and retrieval of print materials. On the technological plane the questions are how does one preserve and promote access to digital archives? How does one address the issue of media obsolescence? These questions are dealt with in Chapter Two.

Paper has traditionally been the main focus of media preservation in records and archives, but the advent of new information technologies that produce a variety of documents has brought a new dimension to issues related to preservation management. Records are increasingly being created in a variety of formats, including digital formats. Digital technology has been popularised by significant improvements in computing technology, that is, faster processors, large capacity storage devices, higher resolution screens, improved networks, more powerful and flexible software.

Outdated formats and obsolescence of hardware and software may bar access to information stored on digital media. Although a number of projects have been undertaken, for example, in the United States of America, United Kingdom and Australia, to address issues associated with digital preservation, procedures and standards for digitisation are still evolving (Shoaf 1996:225; Saffady 1999:318). As yet, records and archival institutions considering digitisation projects will need to become well informed on the topic before planning their own projects.

The technological changes and increased access to documents means that records are in danger of being damaged and lost if not preserved properly. These developments are taking place in South Africa against a general background of the absence of any national preservation policy and plan.

1.1.3 Preservation management in South Africa

Preservation is one of the critical functions of the National Archives and Records Service of South Africa (NARSA) and the provincial archives. Appendix One lists public archives repositories in South Africa. An overview of archival legislation in South Africa underscores a uniform legislative approach regarding the preservation of public records and archives. It is clear from the preambles of the existing archival legislation that the national and provincial archives are concerned with the proper management, preservation and use of public records and archives (South Africa 1996b; KwaZulu-Natal 2000).

Schedule 5 of the Constitution of the Republic of South Africa (Act 108 of 1996) (South Africa 1996a) and the National Archives of South Africa Act (No 43 of 1996) provides for a separation of the archival function between the national and the nine provincial governments (South Africa 1996b). In terms of the structures of the Government of South Africa, NARSA and provincial archives and records fall under the Department of Arts and Culture.³

The National Archives of South Africa Act defines the relationship between NARSA and the provincial archives services. NARSA is responsible for records of national government bodies

³On 1 August 2002 the Department of Arts, Culture, Science and Technology (DACTS) was divided into two separate departments of Arts and Culture on one hand, and Science and Technology on the other.

as well as promoting standards and good practices in records and archives management throughout South Africa. The National Archives Act also provides for the establishment of National Archives Advisory Council, a body, which advise and consult with the South African Heritage Resources Agency on the protection of records forming part of the national heritage (South Africa 2001). At the provincial level there are Archives Councils that coordinate archival policy formulation in liaison with the National Archives Advisory Council (see, KwaZulu-Natal Archives Act 2000). The legislative history of records and archives management in South Africa is discussed in greater detail in Chapter Three.

Provincial archives repositories have the authority to dictate norms concerning the management of public records in government registries and archives repositories. They are concerned with the management of the whole record life cycle, which includes creation, maintenance and use, and disposal of records. In practice, the archival institutions determine record classification systems for the identification, arrangement, storage and retrieval of records. Furthermore, archives officials have a right to inspect public records to determine their use and maintenance. Archive repositories also compile and update lists of the government agencies and other bodies, whose records are transmitted to state custody, and they organise the selection and transfer of such records. As a general rule records are transferred to the archives when they have been in existence for 20 years (South Africa 1996b; KwaZulu-Natal 2000). The holdings of NARSA and provincial archives comprise records in a variety of media. They include paper-based textual records; electronic records as well as audio-visual, photographic and cartographic material (National Archives of South Africa 1997).

The South African records archival infrastructure deals with enquiries on archival matters from state and other institutions and organizations, citizens of South Africa and foreign organizations and individuals. The South African citizens use the information from records and archives for scholarly and personal purposes. Their ability to use the information will largely depend on how it is preserved.

Preservation planning does not appear to be fully integrated into the collection management policy of the national and provincial archives in South Africa. Preservation standards and

guidelines for the long-term survival of the collections are inadequate (Ngulube 2000:9; Olivier 1999:12). There is an acute shortage of staff and absence of expertise in key areas such as preservation (Olivier 1999:12). Financial resources are also diminishing (Kirkwood 1994:14; Olivier 1999:12).

In fact, the preservation of records and archives in South Africa has been characterized as an area of crisis (National Archives of South Africa 1997; Olivier 1999:10). Over 50 million pages of paper-based records are in urgent need of restoration (National Archives of South Africa 1997). The proposition of this study is that one of the ways of understanding the preservation crisis would be to develop preservation strategies and models peculiar to the South African situation. Admittedly, there is a lot to learn from models developed elsewhere, but as environments differ, there is need to develop preservation strategies and models which are specific to the South African situation.

Besides, preservation models have been greatly contested. For instance, until recently there was agreement among preservationists all over the world that stable temperatures of less than 70°F and a stable relative humidity between 30% and 50% were ideal climatic conditions for the storage of documentary materials. The Smithsonian scientists and other experts have argued that the climatic conditions that have always been perceived as suitable for the storage of documents are not globally applicable (Erhardt *et al.* 1995; Lull 1995; McCrady 1994; Peters 1996; 1998; Real 1995). By implication it is essential to analyse each situation in order to establish appropriate preservation conditions.

As Chapman (1990:vi) pointed out, “it is not possible to compile a set of guidelines which will be appropriate in all circumstances”. The old adage: one size does not fit all can also be used in support of Chapman (1990). Scarce resources can be creatively harnessed if appropriate preservation strategies are developed for specific circumstances. The preservation of, and access to records and archives in South Africa is further explored in Chapter Three.

1.2 RESEARCH PROBLEM AND RESEARCH ISSUES

Research has been defined as a process through which data is systematically gathered in order to answer a research question or to get a greater understanding of the phenomenon (Leedy

1997:5; Powell 1999:92). The extent to which the data can be successfully gathered largely depends on formulating a statement of the research questions and objectives. The following subsections are devoted to explaining the research issues that the study addressed.

1.2.1 Statement of the problem

The preservation of public records and archives in general, and vulnerable records particularly in South Africa has been greatly neglected (Olivier 1999:10). Vulnerable records include magnetic tapes, floppy and stiffy disks, photographic prints and films (National Archives and Records Administration 1996). The enactment of laws like the Promotion of Access to Information Act and other regulations are likely to put more strain on the records in whatever form, thus, preservation becomes extremely important.

Although there have been some new developments in the technology and laws used to promote access to information, their full impact on the preservation of records and archives in terms of heavy use, their deterioration and loss are not very clear. There is no clear framework for implementing the new regulations in view of preservation implications for handling of documents. Additionally there are no national standards for the preservation of records and archives. It would seem that, like elsewhere in the world the problem of preservation of records and archives has been exacerbated by the following factors:

- lack of awareness of the importance of preservation (Recommendations 1995:169)
- lack of resources in basic preservation (Kemoni 1996:48)
- lack of training and research in preservation management and techniques (Eden 1997:123; Forde 1998:36; Jones & Ritzenthaler 1988:185)
- lack of standards for the production and the preservation of cultural matrimony and documentary heritage (Swartzburg 1995:246)

Lack of preservation plans in many institutions, and a paucity of information about preservation management have compounded the problems outlined in the preceding paragraphs (Forde 1998:36; Saryan 1999; Ogden 1999). Most of the problems stated in the foregoing paragraph apply to the South African situation where the preservation of records and archives has been characterized as an area of crisis (National Archives of South Africa 1997; Olivier 1999:10). The extent of preservation problems and challenges affecting records and archives in South Africa has not been adequately addressed and evaluated.

1.2.2 Objectives of the study

The study was not intended to answer all questions related to preservation management. It assessed and evaluated the extent of preservation problems and challenges affecting records and archives in South Africa in order to provide direction or guidance on preservation issues. To that end its general purpose was to provide basic and practical information needed to enable staff to both plan and implement sound records and archives care programmes and contribute to the development of national preservation policy. The specific objectives were to:

- assess the activities and strategies used in the preservation of records and archives in South Africa;
- examine the legal situation related to the preservation of records and archives in South Africa;
- establish the impact of information technology and its implications for preserving records and archives and making them accessible over time;
- ascertain the means and processes employed to make information contained in archives and records accessible;
- establish the level of skills and experience in preservation management in South Africa;
- establish potential and actual impact of new laws regarding access to information on the preservation of records and archives;
- determine the short term steps that have been undertaken to safeguard records and archives; and
- contribute facts, analysis and recommendations on preservation issues.

1.2.3 Research questions

Research has been characterised as a process of asking a question (or a related series of questions) in order to initiate systematic process to obtain valid answers to that question (Meltzoff 1998:13). Rephrasing the research objectives outlined in section 1.2.2 generated the research questions. Thus, the research questions were formulated as follows:

- What are the activities and strategies used in the preservation of records and archives in South Africa?
- To what extent is preservation as a records and archives management strategy considered important in records and archives legislation in South Africa?

- What are the possible influences of information technology and its implications for preserving records and archives and making them accessible over time?
- What means and processes are employed to make information contained in archives and records accessible?
- What is the level of skills in preservation management in South Africa?
- What is the potential and actual impact of new laws regarding access to information on the preservation of records and archives?
- What steps have been undertaken to safeguard records and archives?
- What recommendations on preservation issues can be made?

1.3 JUSTIFICATION FOR THE RESEARCH

The justification and significance of the study are concerned with three major questions identified by Creswell (1994:111): How is the study going to add scholarly research and literature in the field? How will the study improve practice? Why will the study improve policy? Although preservation management studies have been carried out in other parts of the world, no such comprehensive studies have been carried out in South Africa. Therefore, the most significant part of the study will be the methodology used and the survey results. If the results of the survey support the hypothesis that there is a dearth of preservation planning, the researcher will share the survey results with the National Archives of South Africa and other stakeholders.

Similarly, if the hypothesis that training in records and archives management in South Africa disregards preservation management, then the survey results and the recommendations are bound to have a profound impact on records and archival training programmes in the formal, non-formal and informal education sectors. If the recommendations of the study are implemented they are likely to lead to the improvement of the actual practice of the preservation of records and archives in South Africa. In fact, Mazikana (1995:27) argued that the lack of research into preservation has remained the main handicap to setting up sustainable preservation programmes and facilities in Africa.

Researchers from other parts of the world have studied preservation management, but their findings may have been implicitly over-generalized to all countries and regions. Chapman

(1990:vi) has pointed out that preservation guidelines cannot be applicable to all circumstances as preservation needs and resources are bound to dictate the kind of preservation programme that an institution can adopt.

Furthermore, every institution has its unique preservation needs. Preservation needs cannot be universalised. This is not to say that in any particular practice universal statements or principles of a general nature are inappropriate and unhelpful. However, suffice it to say that any such statements or principles will be mediated by the local and specific environment by, in other words, the situatedness, which constitutes that practice. Thus, in spite of the fact that research institutions and other scholars in Europe and in North America have developed different preservation models, the need to develop models suited for particular situations still remains an important area of study. In that light, Alegbeleye (1988) in his study of library conservation in Nigeria expressed the need for greater research into conservation problems unique to Nigeria and the tropics. Mazikana (1995:26) also asserted that:

There is general consensus that the preservation and conservation of library and archive materials depends not only on their composition and handling but also on the particular environment of the locality. Methods developed in one hemisphere and geographical belt do not necessarily have equal applicability in other localities. Admittedly the general principles are likely to be the same but whether combining (x) and (y) will produce the same result in the two different locations is an issue that can only be ... determined by conducting ... tests ...

For archival literature to be representative and enriched, research should be conducted across continents and within countries. Commenting on the possibilities and limitations of the archival discourse Cook (1997a) emphasized the need to understand archival theory and practice in the context of place and time. Thus he pointed out that:

Many books could (and should) be written by archivists about their professional history, across the centuries and millennia, across cultures, languages, gender, and nationalities, across differing media and differing types of record creators, across the bridge of theory and practice, that is, across the chasm of the guiding principles and ideas on one side and their actual implementation in archival institutions on the other (Cook 1997a).

The present study recognizes that preservation is an essential element to records and archives management. However, its effectiveness largely depends on being applied appropriately to specific environments. Research into preservation in specific localities is likely to yield reliable empirical data that could be useful for planning purposes. Therefore, this study can serve as an input to producing data that can be used in the South African context, thus avoiding the use of unsuitable preservation solutions exported from elsewhere. This partly explains why the Pan-African Conference on the Preservation and Conservation of Library and Archival Materials held in Nairobi, Kenya from 21 to 25 June 1993 recommended the establishment of research programmes in “existing research institutions to work on problems specific to African preservation issues” (Recommendations 1995:170).

Research into preservation issues is essential because there is mounting evidence that preservation, with its emphasis on maintaining materials in a usable state, either in their original physical form or in some other usable way, should be part of public records and archives management policy to ensure humankind’s continued access to information in the documents.

The potential source of originality and contribution to knowledge of this study will derive from the use of data and its outcome (Burton 2000b:429; Cryer 1996:146-148). Using data to verify or extend an existing theory has been characterized as a type of originality (Blaxter, Hughes & Tight 2001:13; Burton 2000b:429; Phillips & Pugh 1994:61-62). Although, the study applies tools, techniques and theories from other studies, the outcomes will be peculiar to the South African context. To that extent the results will be relatively original.

The review of literature is provided in Chapter Two. Examining reports of previous studies on preservation management led to the identification of “relevant questions” and gaps that are yet to be answered and bridged respectively. Building on the efforts of others, it was realized that preservation studies relevant to specific environments were necessary in order to narrow the knowledge gap between what has been written and the actual practice on the ground.

The purpose of building upon earlier research was twofold. Firstly, the aim was to clarify which research had previously been carried out that could provide answers to the research

questions. The second rationale was to establish if the present research was needed and to choose the appropriate methodology for the research.

1.4 METHODOLOGY

After the definition of the research problem, which was to establish the extent to which preservation management is practised in South Africa, the exploration of existing scientific work provided very little help. The next logical step was to make a decision to carry out an empirical investigation.

While research methodologies revolve around two major approaches (Creswell 1994:1; Leedy 1997:104; Powell 1999:96), namely, quantitative and qualitative this study largely adopted the former. The quantitative-qualitative divide is elaborated on in Chapter Four. According to Locke, Silverman and Spirduso (1998:124) the quantitative approach is the oldest type of research that is capable of describing, predicting and explaining social phenomena, and as result it has provided a “significant part of the foundation on which the social sciences have been erected”.

As it is going to be demonstrated in Chapters Two, Three and Four, previous studies on the preservation of documentary materials by Alegbeleye (1988), Clements (1987), Coates (2000), Conway (1991), Council of State Historical Records Coordinators (1993; 1996; 1998), Eden and Feather (1997), Feather and Eden (1997), Khayundi (1995), Lowell (1986), Mazikana (1995), Mbaye (1995) and Trinkaus-Randall (1990) used the quantitative approach with questionnaires being the major instruments for data collection.

In tandem with previous studies, the present study heavily relied on the quantitative research approach and used questionnaires directed to the heads of the national and provincial archives in South Africa as the key sources of data. Interviews and observation were used as supplementary data collection tools. The population of the study were public archive repositories in South Africa. The fourteen units of analysis were drawn from the Directory of archival repositories in South Africa (National Archives of South Africa 1999). A detailed list of the population of the study is at Appendix One. The survey data was evaluated and

analysed using SPSS®.⁴ The overall aim of data analysis was to describe the characteristics of the population as well as the relationships between the units of analysis. The methods and procedures used in the study are explored in greater detail in Chapter Four.

1.5 DELIMITATIONS OF SCOPE AND KEY ASSUMPTIONS

The study was confined to the preservation of public records and archives in South Africa. It was limited to the state archives repositories. It did not cover statutory bodies and regional departmental offices scattered throughout the provinces as well as records and archives of private organisations. Equally beyond the scope of the study was the Bureau of Heraldry. Although it administratively falls under the National Archives and Records Service of South Africa its major functions have nothing to do with the preservation of records and archives in the country. According to the Heraldry Act, 1962 (No 18 of 1962) the functions of the Bureau are to receive and examine applications for the registration or deletion of heraldic representations, names, special names or uniforms, and issue certificates of registration of the same.

The public sector was chosen because as far as documentary materials are concerned, “governments are the biggest collectors, providers and disseminators in any country” (Evans, Amodeo & Carter 1999:393; Feather & Sturges 1997:199; Heeks 2000:197). Public archives “embody the great fund of official experience that the government needs to give continuity and consistency to its actions” (Schellenberg 1971:10) and to determine policy. In other words, records and archives are the “foundation upon which the governmental structure is built” (Schellenberg 1971:10).

As with all surveys, the generalizability or external validity of these findings beyond South Africa depends on the logic of replication (Campbell & Stanley 1963:30; Kaplan 1964:23). That is, to the extent that additional future studies replicate these findings in other environments, one can have confidence that the results are generalizable. It is important to

⁴ Formerly, the acronym SPSS represented Statistical Package for the Social Sciences, then it was changed to Statistical Products and Services and Solutions. Nowadays it is just used as SPSS® Inc.

emphasize that the survey data would form an important baseline, albeit on South African data, for shaping and formulating further study of preservation issues in other settings.

Due to language limitations the literature review and the examples given are largely drawn from the English-speaking countries in the northern hemisphere and Anglophone countries in sub-Saharan Africa (SSA). The subject of preservation was viewed from a collection management point of view. The main concern was to demonstrate that preservation as a management function should be part and parcel of the management of records and archival resources in South Africa to ensure current and future access to documentary materials.

It is assumed that creators of records are concerned with the use and continued access to their records. It is also assumed that archivists and records managers have moved from the custodial paradigm and have taken up the responsibility of making information readily available to users without diminishing its future accessibility. The other assumption is that preservation could ensure the protection of archives and records as well as guaranteeing their accessibility to users. Trained and skilled staff is assumed to be key to the effective preservation of records and archives and making them available to users.

1.6 ETHICAL CONSIDERATIONS

A sound thesis is a product of ethically obtained and scientifically valid data (DeBaakey & DeBaakey 1975:539). The variables that form the basis of ethics are honesty, integrity, courtesy, and consideration. According to Sapsford (1999:14), all the variables that constitute ethical research are dependent on the researcher. Bearing that in mind, the survey was carried out according to the procedures outlined in Chapter Three. No preconceptions or prior values shaped the results. The research strived to be objective. Ethical issues are further discussed in section 4.3 of Chapter Three.

1.7 OUTLINE OF THE THESIS

The organisation of the thesis was based on guidelines and suggestions from the literature (Mauch & Birch 1993:228; Miller & Taylor 1987:70; Mouton 2001:122-125; Perry 2000; Powell 1997:228-229). Chapter One sets the stage by giving a general background, the statement of the problem and objectives of the study. It also includes the justification for the

study and relevance to the field, background literature used to build the argument, methodology and limitations.

Chapters Two and Three deal with the literature related to the area of study. Building on the experiences of others these chapters reveal what has previously been done on the topic and what is proposed in this study. Chapter Two is concerned with preservation and access to records and archives worldwide, whereas, Chapter Three specifically examines the South African scenario. Chapter Four looks at the procedures and methods used to carry out the study. The aim was to enable another researcher to replicate the study. It typically includes sections on the research methodology, the population and how it was obtained, instrumentation used, step-by-step procedures in gathering and processing data, and statistical treatment of data.

The results that pertain to each research question are reported in Chapter Five. Chapter Six is concerned with the interpretation of the results in the light of the research questions. Chapter Seven is the final chapter. It discusses the conclusions, recommendations and implications of the findings for the field. Finally, the chapter speculates on future research that might be stimulated by extending this study.

Appendices are at the end of the thesis and they include tables, letters to subjects, questionnaires and observation schedule, checklists and other documents or samples that are referred to in the text, that are too distracting or voluminous to have been included within the text.

1.7.1 Referencing convention used in the thesis

The procedure of referring to work produced by others in academic writing is called referencing or citing. There are different methods of citing the literature used in a research project (Jankowicz 2000:162). They are the author - date referencing convention or Harvard citation system, the numbered referencing convention (footnote or endnote style), usually known as the Vancouver system (Burton 2000c:149) and styles recommended by journals and professional associations, for example, Modern Language Association (MLA), American Psychiatric Association (APA) or Institute of Electrical and Electronics Engineers (IEEE).

The Harvard system is the commonly used method of citing references (Burton 2000c:149). The system was developed in the USA and grew in popularity during the 1950s and 1960s, especially in the physical and natural sciences and more recently the social sciences. Over several decades it has become the most common system used internationally and is frequently the standard house style for most academic journals. The Harvard system has advantages of flexibility, simplicity, clarity and ease of use both for author and reader. There is no third place to look for cited sources such as footnotes and chapter references, which are features of other systems. These advantages motivated the study to use the Harvard style of referencing. Although there is no agreed upon standard method for citing electronic sources of information, the study used the style guides associated with the Harvard style for paper-based documents.

The resultant reference list was arranged alphabetically by author and then by date at the end of the final chapter of the thesis. On the other hand, anonymous reports and standards were alphabetized and listed by the issuing institution. It should be noted from the onset that style guides based on the Harvard system are not consistent in their procedures of citing. For instance, some do not drop the brackets around the date. The way of citing without the brackets around the date is called the shorter Harvard method (Mouton 2001:232). On the other hand, some styles do not use (pp.) before the pagination of journals included in the list of references.

Despite the variation of the guidelines from one style guide to another, this study used one referencing convention based on the Harvard system consistently across the entire study. It was tempting to use the guide that the Information Studies Programme at the University of Natal relies on for referencing purposes, but the problem is that it is “simplified” and incomprehensive (Aitchison 1999:1). In fact, Aitchison (1999), the author of the guide, refers the readers to their lecturers as well other style guides for more information on referencing.

1.8 SUMMARY

This chapter introduced the core research problem and then “set the scene”. The stage was set by discussing on the background to the statement of the problem, and the research problems and issues. There followed justification of the research, a brief background to the literature

review, methodology used in the study, scope and assumptions of the study, ethical issues in research, an outline of the thesis and the referencing convention used in the study.

The main concern of the Chapter was to demonstrate that despite the existence of studies concerned with preservation issues,

.... all of the problems in regard to the preservation of archival materials have not been solved, most have been identified and many of those still unsolved are being aggressively investigated (Cunha & Cunha 1983:3).

Though this observation was made in 1983 it still applicable. For instance, preservation management has remained the subject of sessions at many meetings of national, regional and international organisations. The fact that the subject is discussed repeatedly is a reliable indication that problems remain unsolved. It is also important to point out that there will never be a point when humankind's knowledge about a subject will ever be complete. Research into various issues is indispensable because the state of human knowledge is incomplete. Accordingly:

Everywhere, our knowledge is incomplete and problems are waiting to be solved. We address the void in our knowledge and those unresolved problems by asking relevant questions and seeking answers to them (Leedy 1997:3).

Starting with the review of literature the following chapters are going to search for answers to the research questions raised in this chapter in order to expand the knowledge base on the preservation of, and access to records and archives in general and South Africa in particular.

CHAPTER TWO: PRESERVATION AND ACCESS TO RECORDS AND ARCHIVES WORLDWIDE

[A]ll social research has relevant literature, and no research takes place in a vacuum (Punch 2000:42)

2.0 INTRODUCTION

The chapter discusses the literature on the preservation of records and archives in general. Building upon previous studies this chapter begins by addressing the purposes for which the literature was used in the current study and then shows the paradigm shift that has occurred in the preservation of records and archives. Preservation management concepts in records and archives worldwide as well as access issues are presented. The issues that specifically pertain to the preservation of, and access to records and archives in South Africa are dealt with in Chapter Three.

The purpose of building upon earlier research was twofold. Firstly, the aim was to clarify which research had previously been carried out that could provide answers to the research questions. The second rationale was to establish if this research was needed and to choose an appropriate methodology for the research.

2.1 PURPOSE OF THE LITERATURE IN RESEARCH

The literature was used for the purpose of review and for referencing. Literature review has been defined as:

a systematic, explicit, and reproducible method for identifying, evaluating, and interpreting the existing body of recorded work produced by researchers, scholars, and practitioners (Fink 1998:3).

Thus, the literature review established information sources and evaluated their methodological characteristics and content in relation to the research problem. Methodological features refer to study methods which include research design, data collection and data analysis, whereas the content consists of the objectives, findings and conclusions (Fink 1998:63). Referencing comprises the text or quotation being referenced, the reference itself and the corresponding bibliographic entry.

2.1.1 Use of the literature in referencing

Referencing is a standardised method of acknowledging sources of information and ideas that one gets in the literature, in a way that uniquely identifies their source. References were used for a variety of purposes as demonstrated by Blaxter, Hughes and Tight (2001:127) and Jankowicz (2000:162). In a nutshell, they were used to inform the readers where certain ideas used in the study came from as well as proving that the study has a substantial and factual basis. They were also used to attribute quotations and to provide justification and support for arguments that are advanced in the study. Furthermore, referencing was used to justify the reasonableness of the methods used in the study, since other people in the field had also used them. Last, but not least, it was used to allow readers to identify and retrieve the references for their own use. The convention governing the form that the references took was discussed in section 1.7.1 of Chapter One.

There are several software packages for storing and managing bibliographic references. They include Pro-Cite®, Papyrus®, Reference Managers® and others (Gray 2000:74). However, EndNote® version 5 was used to manage the bibliographic references in this study. EndNote® is a complete bibliographic database and management program designed to search online databases, organize references, and create one-step bibliographies in Microsoft Word® and WordPerfect® (ISI ResearchSoft 2002). Pro-Cite®, Reference Managers® and EndNote® are published by ISI ResearchSoft whereas, Papyrus® is published by Research Software Design (2002). The major features of ISI ResearchSoft software packages are summarized in Table One below.

In addition to some of the advantages of EndNote® that are evident from Table One, the software was selected because the statistics from the publishers of the three software programs showed that EndNote® was the most popular and easy-to-use package (ISI ResearchSoft 2002). Its popularity can be attributed to its current lower cost than the other two products. The researcher also tried the Papyrus® version 7.0 downloads free demonstration, but did not find the user interface as user-friendly as in EndNote®. Although, it is almost half the purchase price of EndNote®, Papyrus® version 7.0 seems to be currently less established and unpopular with the research community. Judging by the user comments at the Research

Software Design website the bibliographic software package is making some inroads into the biomedical field.

Table 1: Selected features of ISI ResearchSoft™ bibliographic products

Feature	EndNote®	Reference Managers®	Pro-Cite®
Version	5	10	5
Search the Internet	Yes	Yes	Yes
Organize references	Yes	Yes	Yes
Format bibliographies	Yes	Yes	Yes
Operating system	Macintosh (Mac)& Win	Windows (Win)	Mac& Win
Maximum number of references	32 000	Unlimited	Unlimited
Maximum number of fields	38	37	45
Maximum number of reference types	25	35	50+
Spell check	Yes	Yes	No
Number of output styles	700+	650+	620+

Adapted from ISI ResearchSoft (2002).

2.1.2 Review of the literature

It is axiomatic that “all social research has relevant literature, and no research takes place in a vacuum” (Punch 2000:42). Jankowicz (2000:159) confirmed that:

Knowledge doesn't exist in a vacuum, and your work only has value in relation to other people's. Your work and findings will be significant only to the extent that they're the same as, or different from, other people's work and findings.

Literature review also recognizes that every theory is related to at least one other theory through sharing concepts or propositions (Kuhn 1962; 1970). Propositions explain the way events occur. According to Hoover and Donovan (1995:423) propositions are theories that provide patterns for data interpretation as well as conceptual frameworks (Hoover & Donovan 1995:44; Powell 1999:96).

Essentially, the literature was reviewed to identify theories and ideas that were to be tested using data. This method of developing a theoretical or conceptual framework that is subsequently tested using data is called a deductive model (Creswell 1994:88; Saunders,

Lewis & Thornhill 2000:45). It is quite the opposite of the inductive approach where data is explored in order to develop theories that can be related to the literature. According to Creswell (1994:94) qualitative studies use the inductive model whereas the deductive approach is generally used by quantitative studies. The qualitative and quantitative approaches to research are discussed in more depth in Section 4.1 of Chapter Four. Furthermore, Saunders, Lewis and Thornhill (2000:91) pointed out that deductive research is economic and less protracted than inductive research. The survey method, which was used in the study, is generally associated with the deductive approach (Saunders, Lewis & Thornhill 2000:93).

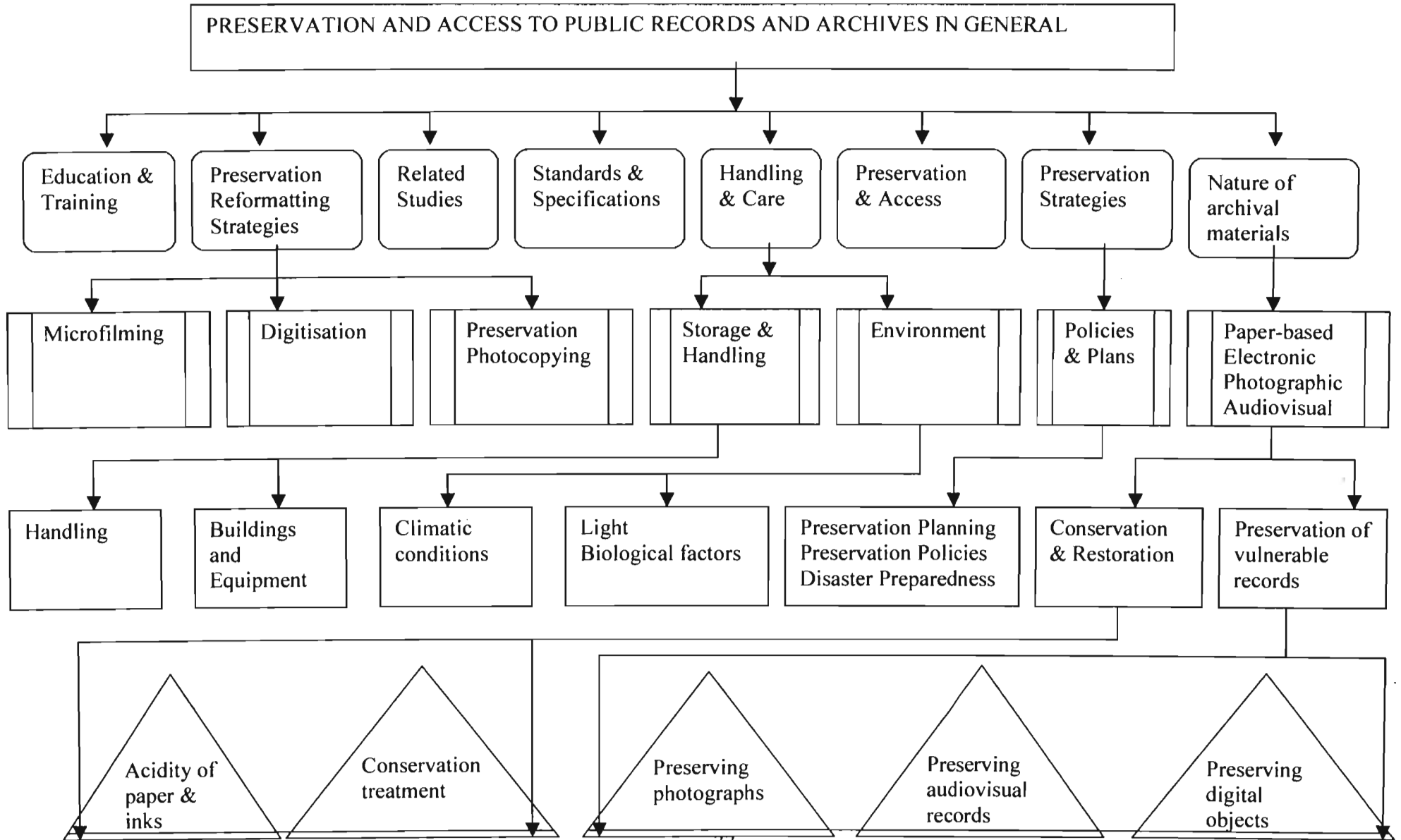
Steps taken in the review of the literature involved a systematic identification, location, evaluation and interpretation of the existing recorded body of knowledge and information relating to the research problem (Fink 1998:3). The review of literature serves a variety of purposes (Birmingham 2000:26; Bless & Higson-Smith 2000:20; Cooper 1998:25; Creswell 1994:20-21; Hart 1998:27; Leedy 1997:71; Mauch & Birch 1993:67-68; Sapsford 1999:43; and Saunders, Lewis & Thornhill 2000:45).

Although, the list of purposes of the literature review is endless six common examples are discussed below. Firstly, it places the research in a context related to existing research and theory. Secondly, it provides a framework for establishing the importance of the study, as well as establishing tools for comparing the results of the study with other findings. Thirdly, it ensures that one's research would contribute to a better understanding of the phenomenon under study. Fourthly, it identifies the main methodologies and research techniques that have been used. Fifthly, it provides an opportunity to discuss relevant research carried out on the same topic or similar topics. Finally, it helps to avoid pitfalls and mistakes made by others.

2.1.3 Research map of the literature

Prior to consulting sources of information, the structure of the issues pertaining to preservation were identified and systematically organised. A research map of literature or a relevance tree of literature suggested by authors like Creswell (1994:29; 2003:39), Jankowicz (2000:167), Locke, Silverman and Spirduso (1993:75) and Saunders, Lewis and Thornhill (2000:58) was constructed and is illustrated in Figure One below. The network of core terms for the literature in question is at times referred to as Papineau's (1979) tree.

Figure 1: Research map of the literature



MindManager 2000 Version 4.0®, a visual thinking tool created by Mindjet (2001), was used to construct the research map of literature. Visual thinking helped the researcher to organize, structure, and present the literature related to the study. Through the technique, important subjects were identified and priorities as to what to locate and consult first were also established. Thus the research map of literature helped to demarcate the scholarship to be included in the literature review.

As described by Creswell (1994:30), the relevance tree is a rough-and-ready directed visual map that starts with a general title and branches out into aspects of the general title that may occur to the researcher. In this case the researcher started with the research topic at the top and identified two or more subjects that were important to the research. The subject areas were further subdivided into sub-areas. As reading and reviewing the literature progressed new areas were added to the relevance tree. However, some of the areas that were identified and that should have formed some of the branches of the relevance tree illustrated in Figure One were left out because the software only accommodated a limited number of fields. For instance, the activities involved in restoration and conservation processes were left out. So were the details of preservation reformatting strategies and biological factors just to mention a few. The identified areas pertaining to preservation and access are discussed in detail in the subsequent sections of this chapter.

2.1.4 Sources of information

The development of a literature relevance tree is predicated on finding the literature. Bibliographic sources suggested by Behrens (1994:115-117), Creswell (1994:33-35), Hart (1998:34), Lane, Chisholm and Mateer (2000) and Powell (1997:205-207) including, electronic sources such as, UMI ProQuest Dissertation Abstracts International, Educational Resources Information Centre (ERIC), Information Science Abstracts, Library and Information Science Abstracts, Library Literature, South African Bibliographic and Information Network (SABINET) were used to identify literature related to preserving and accessing records and archives.

In addition, the Internet was used both as a bibliographic source and a discussion forum through *listservers*, that is, electronic discussion groups, such as Archives Discussion

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Listserver archives@listserv.muohio.edu, Conservation Discussion Listserver at consdist-request@lindy.stanford.edu, Microlink Discussion Listserver at <http://www.slsa.sa.gov.au/microlink> and Digital Preservation Discussion Listserver at <http://www.jiscmail.ac.uk/didital-preservation> and other Internet discussion groups (IDG).

2.2 THE RELATIONSHIP BETWEEN PRESERVATION AND ACCESS

According to de Stefano (2000:317) preservation and access share a correlative and causal relationship. In that sense, one implies the other while on the other hand, the need for access to information necessitates the need of preserving the intellectual content of documentary materials. The two are reciprocal. At a mundane level, preservation and access are integrated when staff assess the physical status of documents as they are used. A point-of use preservation survey is another way of monitoring heavily used materials and facilitating their preservation (Jo Pugh 1992:66). Issues pertaining to access to records and archives are discussed later in sections 2.15 and 3.3 of chapters Two and Three respectively. At this stage, a few relevant elements are discussed to show the link between preservation and access.

Access enhances the chance that archives can be understood and used as sources of information (Menne-Haritz 2001:78). However, the custodial paradigm that has influenced the attitude of the archivists to their holdings may lead to the assumption that access and preservation are contrary goals (Menne-Haritz 2001:70). The custodial paradigm puts an emphasis on securely storing and keeping documentary materials out of risk or danger so that they could survive over a long period of time, if not permanently. Opening materials to the public is not of prime importance to information professionals with a custodial outlook.

The concept of access goes against the grain of the custodial paradigm as it puts documentary materials in danger, because every instance of handling, and every environmental change threaten the integrity of the materials. So it seems logical to restrict use and consultation. But on the other hand, without access, preservation activities cannot be justified. Consequently, archivists have moved from the custodial role, in which their major duty was to protect archival holdings by limiting use, to that of promoting the wider use of archives (Jo Pugh 1992:5).

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Preserving and providing access to records and archives are some of the major reasons for the existence of archives (Ward 2000:43). Indeed, the important mission of many national archival institutions is to facilitate access to their holdings. No archivist or records manager needs to be reminded that they create, acquire and preserve records and archives in order that they can be used. According to Matthews (1990) preservation is a broad umbrella encompassing many activities that facilitate access to documents. The activities are largely aimed at protecting and securing documentary materials to guarantee their availability, access, and use. In fact, to de Lusenet and Drenth (1999), “[p]reservation is a must for continued access”. Indeed, preservation has been defined as:

extending the life of materials for the purpose for which the materials exists in the library collection or archives ... and maintaining access to recorded knowledge as far into the future as possible (Gracy 1995:25).

Thus, preservation guarantees continued availability and usability of information contained in records and archives. Preservation is not an end itself, but it is a means to achieving a desired end: access. However, attaining this goal largely depends on how records and archives are preserved, their arrangement and description, and laws governing access.

Access can be defined in a number of ways. Access can be bibliographic or physical. The two aspects of the definition of access apply to paper, microform or electronic formats (Rutstein, DeMiller & Fuseler 1993:48). The need to provide both physical and intellectual access is a major justification for the preservation of records and archives. According to Arnoult (1995:17), the purpose of “preserving is not to preserve for pleasure”, but it is done to ensure access. Preservation is not an end in itself, but it is a means of diffusion and communication. To de Lusenet and Drenth (1999), “preservation and access are inextricably entwined, so that one could even speak of preservation for access”.

Though the “preservation is access, and access is preservation” equation by Battin (1993:367) has been questioned by scholars like Cloonan (2001:240) it does not take away from the argument the fact that the major reason why materials are preserved is to facilitate present and future access. It would be stretching the argument too far to say that Battin (1993) meant that preservation was the same as access as Cloonan (2001:240) would have us believe.

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Definitions of concepts used in the study in section 1.1.1.3 of Chapter One demonstrated that the terms do not mean the same thing and it is assumed that Cloonan (2001) knows that. The point being made by Battin (1993) is that preservation and access are inextricably connected to the extent that the two can be regarded as symbiotic. Records and archives that are not preserved will not be available for future generations. According to Baker and Soroka (1978:5), “preservation is the indispensable means of assuring the availability of knowledge and access to it”. Thus, the need to facilitate access to the records of the past justifies preservation.

The main dilemma of the archivists is to strike a balance between maximising access to records and archives and preserving the materials. Handling, as it is going to be demonstrated in section 2.8 below, damages archival materials. Archival institutions have resorted to reformatting strategies in order to protect their documents while at the same time facilitating access. Reformatting produces surrogates of the deteriorating documents and materials in high demand rather than providing the original. Surrogates are produced through photocopying, microfilming and digitisation. These reformatting strategies are discussed later in detail in section 2.7 below.

Although, the terms “preservation and access” have become a rallying cry for archives in their quest for funding and justification of their existence, institutional policies and resources show a disparity between “preservation” and “access”. This should not come as a surprise to anyone who has worked in archives and records centres. A besetting problem of archives has been a shortage of resources for providing proper access to archives through the essential work of arranging, describing and preservation. As with fragments from an archaeological site, meaning can only be given to documents once they have been pieced together, identified and described. Many records and archives remain inaccessible to the public because they have not been arranged and described. This constitutes a major infringement of the people’s right to information that would be otherwise open to the public.

The archival profession has long advocated intellectual freedom and deplored censorship. Yet the content of many records and archival materials is at risk of censorship due to the inherent fragility of their materials, poor storage conditions, and mishandling. Archival documents that

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have been printed on acid paper will become brittle and disintegrate over time due to a weakening of the paper fibres. However, a variety of methods can be used to capture the content of brittle records and archives before they crumble. Microfilming can preserve a document's content, while paper deacidification can stabilize and halt the disintegration of acidic paper. Materials can also be printed on alkaline, or non-acidic, paper at a cost comparable to printing on acid paper.

The preservation challenges and issues outlined in the foregoing paragraphs will be elaborated on as each of the elements that constitute an archives preservation programme are examined more closely in the ensuing sections of this chapter. Some of the major elements of an archives preservation programme that are discussed are: control of the environment, building design and storage, disaster preparedness, handling and maintenance, reformatting of deteriorating materials, conserving individual items, preservation policies and plans to coordinate preservation activities and raising awareness on the importance of preservation (Gracy 1995:31-35). For the moment, let us turn to the changes that have taken place in the perception of the role of archivists in the preservation of documentary materials.

2.3 PARADIGM SHIFT IN THE ROLE OF ARCHIVISTS AND PRESERVATION MANAGEMENT

In philosophy of science, "paradigm" is one of the terms used to depict changes in theories and perceptions of the world as society evolves (Kuhn 1962; 1970). According to Seel (2001) the term "paradigm" comes from the Greek word *paradigma*, meaning pattern or example. Its modern usage dates from Thomas Kuhn (1962). Kuhn was interested in how scientific progress actually comes about. He argued that all 'normal science' takes place within a pattern or paradigm and that revolutions in scientific thought only come about when people are able to break out of the pattern and create new ways of seeing and thinking, that is, a new paradigm (Kuhn 1970:180-181). According to Kuhn (1970:180-181) the changes can be radical involving a reconstruction of "group commitments". The changes in theories become the building blocks of paradigms. MacNeil (1994:7) characterized a paradigm shift as a new way of thinking about old problems. According to MacNeil (1994:7) a paradigm shift "begins to take place when new observations, inexplicable in the terms of the old framework of explanation, begin to crop up and strain that framework".

For the purpose of the present study, paradigm means a world outlook of a particular discipline (Punch 2000:35). The perspective or paradigm of regarding the role of archivists as curatorial has changed over time. Societal, technological and professional developments in the archival world have thrown into question some of the basic views pertaining to the nature and value of archives. The role of the archivists in preservation management and providing access to records in their custody had to be re-examined in the light of the shift from a purely curatorial role to one of facilitating continued access to records and archives.

Similarly, preservation has shifted from being item oriented to being collection aligned. Archivists had to rethink the whole concept of item oriented conservation in favour of preservation as a result of new formats ushered in by technological changes as well as the increasing number of records that needed attention. The shift in the role of archivists and the change from the item approach to the preservation perspective in the management of records and archives is dealt with in sections 2.3.1 and 2.3.2 respectively.

2.3.1 Role of archivists in preservation management

The role of archivists has been perceived differently through the ages (Couture & Rousseau 1987:25). In Antiquity and the Middle Ages archivists were concerned with the primary value of records, that is, the reason for their creation and use (Couture & Rousseau 1987:25). From the Middle Ages onwards, archivists became concerned with the secondary value of records, that is, their informational and research values. This partly explained why the preservation of archives became “intimately associated with their appreciation of their value as historical evidence” (Hodson 1972:13). This meant that the archivist became concerned with acquisition, selection, arrangement, description and preservation of archives (Mnjama 2000:43). Hitherto, these activities were performed during records disposition, a stage that constituted the last phase of the record life cycle.

The growth in the volume of documents and the advent of other record formats besides the predominant paper media expanded the archivist's responsibilities to overseeing and embracing all the stages of the life cycle of documents (Society of American Archivists 2000). The need to preserve various records formats calls for a change of the role of the archivists

from a traditionally curatorial one to that of ensuring the proper preservation of archives throughout their entire life cycle and guaranteeing a continuum of access.

The archivist's role can no longer be confined to the traditional curatorial role of preserving the historical record (Society of American Archivists 2000). That partly explains why most archival legislation makes it mandatory for national archives to control the creation and disposal of public records. Many archivists are now part and parcel of the management of records throughout their entire life cycle in order to facilitate their preservation and continued access to them by the public. This fact is going to become apparent in Chapter Three where the management of records and archives in South Africa is dealt with.

2.3.2 Conservation to preservation

Prior to the 1970s, the focus of preservation was limited to the conservation and restoration of older, rare and precious documents (UNESCO 2000). The emphasis was on treatment of individual items (Morris 1990:245). Archivists left all the work to specialised paper conservators and bookbinders (Cunha 1990:193). Initially the single object oriented approach was justifiable because the volume of records that needed attention was relatively small. The archival profession changed this outlook and accepted the responsibility of preservation management when they realized that the single object conservation orientation could not cope with the overwhelming volume of public records that needed attention (Porck & Teygeler 2000).

Kathpalia (1973) was one of the pioneers who advocated the change from item oriented conservation to preservation management. Since the 1970s archivists have moved from merely estimating the extent of deterioration to instituting preservation programmes. Many collection wide surveys have since been carried out to evaluate the quantity of endangered documents (for example, Feather & Eden 1997; Lowell 1986; Matthews 1999; Trinkaus-Randall 1990). Preserving all the archival holdings signified the shift from conserving one archival item to collection-level preservation of archives. Nowadays, many archivists appreciate preservation to be an integral part of their archival management functions as it affects all archival operations (de Lusenet and Drenth 1999; Ritzenthaler 1993:viii). This partly explains why

preservation is now generally regarded as a “process to be managed rather than a problem to be solved” (de Lusenet and Drenth 1999).

Emphasis has shifted from ad hoc reactions to materials already in an advanced stage of deterioration to planned and coordinated preservation programmes featuring preventive measures (Walters 1998:159). Consequently, current preservation science research concentrates more on damage prevention (for example, storage conditions, environmental monitoring, condition assessment, disaster preparedness and reformatting) than on the development of new or improved conservation techniques.

2.4 PRESERVATION OF ARCHIVES AND LIBRARY MATERIALS

Although a sustained campaign has been underway to preserve published materials of importance to scholarly research, there has not been a similar impetus for the preservation of unpublished materials and the kinds of collections held by archives. A cursory look at selective bibliographies on the conservation and preservation of library and archival materials shows that a lot of literature exists on the preservation and conservation of library materials as opposed to records and archives. DeCandido and Cherly (1992), Jordan (2000) Saryan (1999), and Schnare, Swartzburg and Cunha (2001), for example, have very few entries on archival preservation. This is a clear testimony that literature on the subject is very sparse.

The paucity of literature in the archives sector is surprising because preservation is “central to the work of archivists in a way that it is not to all but a few librarians” (Eden & Feather 1996:38). In that sense, “it is ironic that archivists have watched librarians capture the preservation spotlight” (Kaplan & Banks 1990:269). Literature on preservation of library materials has “come to age” and the librarians in the developed world have developed preservation practices that have “their own history, methods, subspecialties, and philosophical schools” (Jordan 2000:4). However, in the case of Sub Saharan Africa, only librarians in Nigeria have drawn a lot of attention to preservation and conservation in Africa by generating useful literature on the preservation of documents (McIlwaine 1994:61).

A further survey of literature reveals that preservation issues in archives are generally incorporated as a subsection of preservation in libraries. For instance, Swartzburg (1995:156-

159) mentioned archival records in passing, and only in so far as they related to special materials in the library. The treatment of preservation in archives as a sector of library preservation has largely been attributed to the fact that archivists and librarians face the same preservation problems (Eden 1997:128; Feather & Eden 1997:53).

However, Battin (1990:189) argued that while there are similarities in preservation policies and practices between the two professions, “the enormity of the impact of acid paper on ... governmental archives far exceeds the dimensions of the brittle book challenge”. In addition, books and archives are different (Battin 1990:189; Mazikana 1995:21). Archives cannot be kept on the open shelves for browsing, as is the case with library books. They cannot be borrowed, or even moved around from one room to another unsupervised. Close attention has to be paid to the bona fides of their readers, who will also require more invigilation than is necessary for those studying most reference books.

Additionally, archival materials are primarily documents that exist in unique copies that are generally irreplaceable while most library materials are published in multiple copies. In addition, the differences stem from the fact that archives are “... unique and not amenable to cooperative selection and microfilming projects in the same manner as brittle books” (Battin 1990:189). In that light, while co-operation and collaboration as envisaged by Feather and Eden (1997:53) and the Pan-African Conference on the Preservation and Conservation of Library and Archival Materials (Recommendations 1995:169) is essential, it should not be at the expense of archivists.

In fact, the Royal Commission in its report entitled, Archives at the millennium, covering the period 1991 to 1999, discouraged such an association. It argued that while “cohabitation” with libraries is welcome their approaches to preservation are different, and “archives’ true potential might be cramped” by such an association (Archives collaborate 1999:631). However, Conway (1990:222) had a persuasive point when he argued that archivists should learn from librarians who have already made “unprecedented progress” in setting priorities, and developing and implementing nationwide strategies, for example, in the United Kingdom and the United States of America. It seems that although libraries and archives have their own

specific activities according to their missions, they must cultivate their differences in harmony and co-operation.

The Pan-African Conference on the Preservation and Conservation of Library and Archival Materials held in Nairobi in 1993 also recognised the importance of “a co-operative approach to preservation and conservation issues” and recommended that African librarians and archivists should join hands and work together (Recommendations 1995:169). Even if the materials and methodologies of archivists and librarians vary, their programmes goals and preservation concerns are related in many ways. They share one important thing in common: they both exist to preserve and provide access to information. In that light, Ward (2000:44) concluded that:

Although preservation programs designed for libraries may not be immediately transposable to the archival environment, with creative adaptation, archivists can successfully employ library models.

Therefore, librarians and archivists should work together and develop long-term solutions to the preservation of both paper-based materials and vulnerable digital objects.

In addition to collaborating with librarians and adapting their preservation models, archivists need to know the characteristics of the media that are used to create records and archives. The following sections consider some advantages and limitations of paper, electronic formats, film and photographs. The understanding of the nature of archival materials is key to providing adequate handling, monitoring and storage requirements. The discussion of leather materials, which were predominantly used in the Middle Ages as binding, writing and printing surfaces for manuscripts, is beyond the scope of this study. In any case, available evidence indicates that vellum and parchment manuscripts are very rare in archival repositories in South Africa.

2.5 PRESERVATION OF PAPER-BASED RECORDS AND ARCHIVES

Most documents originate in paper form. While an increasing quantity of information is captured at its source in electronic formats, a significant percentage of Africa’s archival documents exist solely in paper (Katundu 2001:179; Ngulube 2002a:118). In fact, until recently, paper was the most common medium available for document creation (Hunter 1997:133; Ritzenthaler 1993:19; Saffady. n. d). Even documents created in electronic formats

by word processors are usually printed on paper for reference, distribution, or filing. Many e-mail messages are likewise printed and filed. Generally, most documents from external sources are usually received in paper form. The stress and treatments applied during printing, converting, handling and storage as well as the process by which the paper is made all affect the useful life of paper.

Paper was first used in China in the second century A.D (Browning 1970a:18; Swartzburg 1995:129; Viñas & Viñas 1988). The Chinese system of papermaking was first passed to Korea and later to Japan in the seventh century. The Arabs learnt the art of papermaking from Chinese prisoners of war in the eighth century. From the tenth century paper spread slowly across Europe and reached Russia in the eighteenth century, later than America and South Africa where the Spaniards and the Dutch introduced it in the sixteenth and seventeenth centuries respectively.

Initially, paper was hand made. The paper was of high quality and acid free (Harris 2000a:37). Little by little, the manual procedures gave way to more mechanized methods. The first papermaking machine appeared at the end of the eighteenth century. As the demand for paper increased in the 19th century, a serious shortage of cotton rags quickly developed. Wood pulps, sized with alum and rosin, replaced cotton in papermaking (Crespo & Viñas 1990; Viñas & Viñas 1988). The disadvantage of wood was that it had a higher lignin content. According to Wachter (1989) 50% of paper manufactured since 1850 contains lignin. Lignin constitutes between 16% and 34% of most wood species (Museum of Fine Art n. d; Ritzenthaler 1993:24). Lignin is the element that negatively affects the longevity of paper. Lignin causes paper to become yellow and brittle through photochemical oxidation.

In addition, about 97% of all paper produced since 1850 is acidic (Wachter 1989). According to Wachter (1989), the loss of endurance in this paper or specifically the fold endurance of this paper drops by 82% in 21 years. Folding endurance measures the number of double folds, which can be accomplished until the paper fails under a specified tension. The MIT tester is the commonly used instrument for measuring folding endurance.⁵ The folding endurance test

⁵ MIT Fold Endurance Test was developed at the Massachusetts Institute of Technology (MIT). A strip of paper is held (normally ten specimens in the machine direction and ten in the

is very important in papers which are subjected to folding during use, for example records (Browning 1970a:27).

The preservation of pre-19th century documents is less of a problem than for those made from the 19th century onwards because they were made with hand made rag paper. The sizing used in hand made paper was either gelatin or starch, both of which are non-acid substances. Mechanical pulping used to produce most of the paper since the nineteenth century sowed the seeds of the deterioration of paper. Mechanical pulping involved the conversion of raw wood into papermaking pulp by use of mechanical means only and did not involve the removal of lignin. Even paper that is manufactured through the thermo-mechanical and chemithermomechanical processes still contains lignin.

Lignin and the modern process of sizing render the paper acidic. Alum rosin was used as substitute for gelatin from 1840 onwards as it was considered economical (Ritzenthaler 1993:23). Unlike, gelatin, alum could be added directly to the vat of water used to dilute the pulp rather than being applied after paper sheet formation. Alum is used with rosin (the actual sizing agent). Sizing has a great deal to do with the printability of paper. Paper sizing is necessary because cellulose is not very ink-receptive. Some materials like rosin and alum are added into the pulp to increase opacity and ink-receptivity in the finished product. Sizing also keeps ink from spreading and slows the absorption of water by the paper. Alum rosin reacts with moisture creating sulphuric acid. Acidity has been identified as the principal cause of paper deterioration. The problem of the acidity of paper is dealt with in section 2.5.1 below.

2.5.1 Acidity

Decades of scientific research have revealed that acidity is a direct cause for hydrolysis which occurs in paper. According to the Webster's seventh new collegiate dictionary hydrolysis is "a chemical product of decomposition involving splitting of a (cellulose) bond and addition of the elements of water". The major sources of acid in paper are lignin and alum/rosin. Alum (aluminum sulphate) reacts with moisture creating sulphuric acid (H_2SO_4). Hydrogen ions

cross-direction in order to characterize a single sheet of paper are taken), under a controllable tension (measured in kilograms), and folds it back and forth, counting the number of folds until the paper breaks (Browning 1970a:18).

(H⁺), from the sulphuric acid, then split the cellulose bonds damaging the fibres and ultimately destroying the paper. Deterioration of paper is accelerated by external factors such as temperature, humidity, light or chemical pollution. The environmental factors that lead to the deterioration of paper are discussed in section 2.8 of this chapter.

Acid content in paper can be measured by alkaline reserve titration, odometric total acid, and surface and cold extraction of pH (Burgess & Binnie 1990:134). The level of acidity or alkalinity in a paper is measured in terms of the concentration of the hydrogen ion. Thus pH (literally potential of hydrogen) is a symbol representing quantitatively the hydrogen ion concentration. pH value is measured on a logarithmic scale numbered from 0 to 14 with 7.0 as the neutral point (International Communication Association 1969:2). In that case, pH is the negative logarithm of the hydrogen ion (activity) concentration per litre of an aqueous solution, measured on a scale of 0-14. (Browning 1970b:30; Ritzenthaler 1993:25). According to Browning (1970b:30) at 25°C, neutrality is represented by a pH of 7.0.

The pH of paper may be measured colourmetrically with certain chemical indicators (for example, Merck strips) or, more accurately, by potentiometric methods using electrodes. A pH pen, containing chlorophenol, will also indicate if a paper is alkaline or acidic. Ink will turn purple on alkaline paper, and yellow on acidic paper. A pH level below 7.0 is acidic, and a pH level above 7.0 is alkaline. Every whole number increase represents a tenfold change in the scale. Permanent-durable paper made of good quality wood pulp, which has an alkaline reserve must be used in order to partly deal with the problem of acidity of paper in the preservation of records and archives.

Permanent-durable paper is slightly alkaline, ranging from a pH of 7.5 to 9.0. A central component in the alkaline system is calcium carbonate. Calcium carbonate is an alkaline mineral, which is like marble dust. Calcium carbonate fills the space between the cellulose fibres to provide opacity and an even formation. Although acids are formed even in alkaline paper, they are neutralized by the alkaline reserve before they can do any damage to the cellulose molecule (Burgess & Binnie 1990:138).

In dealing with paper-based materials, remedial preservation procedures like deacidification are more expensive than preventive measures. Archivists and records managers should promote the use of permanent paper by approaching and holding discussions with paper manufacturers. Many paper manufacturers, including some in highly developed countries, have made very little progress in switching from acid to alkaline paper (Harris 2000a:38). National and provincial governments should also be encouraged to provide policy guidelines to support the efforts of archivists and records managers in promoting the use of permanent paper as what happened in the US. It will take a lot of effort to convince paper manufacturers to change over to acid free paper, but archivists should persevere until final victory.

The use of permanent and durable alkaline paper in creating documents of enduring value is widely recognised in the developed world. In January 1988 the American Library Association (ALA) passed its first resolution on permanent paper (Swartzburg 1995:9). Senator Clairborne Pell's first Bill on the use of alkaline or permanent paper was introduced in October 1988, and was promptly endorsed by another ALA resolution in early 1989. This led to similar resolutions organizations in the US and then by IFLA and the International Publishers Association later in 1989. In October 1990 the American Congress passed legislation establishing a national policy on permanent paper (Billington, Peterson & DiMario 1993).

Unlike, the rest of the developed world, papermakers and record creators in Africa continue to respectively produce low quality paper and create records on such paper. Records managers in Africa do not seem to be insisting that records of continuing value be created on permanent paper (Aziagba 1991:79; Ngulube 2002a:118). Akussah (2002:163) made the same observation after investigating the management of public records in Ghana. The quality of paper that should be used for creating records and archives is dealt with in the next section and section 3.3.1 of Chapter Three.

However, it is unlikely that permanent alkaline paper will ever be used universally. Thus, examination and testing of documentary materials will need to become a routine part of the archival processes in most archival institutions. Simple tests can include testing the pH of paper. If the pH is below 7.0, materials should be treated or microfilmed before being added to

the archival holdings. Some of the conservation procedures such as deacidification and creating microclimates will be elaborated on in the ensuing sections.

2.5.2 Quality of paper for records and archives

Records and archives should be created using alkaline or acid free permanent paper. The permanence of paper used for records has been a subject of concern for more than 200 years (Browning 1970a:31; Smith 1969:154). Permanent paper can retain its original character without alteration over many decades. Permanency is not synonymous with durability. According to the American Paper and Pulp Association (1965:36), durability is the property of resisting deterioration by use, whereas, permanence refers to the degree to which paper retains its original quality during storage. Durability depends on the choice of fibres, manufacturing process and chemicals used to enhance resistance to damage during handling. On the other hand, permanence is determined by the composition of the paper and by external conditions to which it is subjected to during storage and use.

The need to protect human documentary heritage was underscored in 1995 by the International Organization for Standardization (ISO) when it developed ISO/DIS 11108, a standard for archival papers. The full title of the documentation standard is at Appendix 14. The question of the use of standards is not discussed here because it is covered in section 2.13 below.

It is plain that ISO took its cue from the United States Congress that had passed legislation establishing a national policy on permanent paper on 12 October 1990. The law was designed to preserve the American documentary heritage. The legislation made the use of acid free permanent papers mandatory in the production of US Federal records, books, and publications of enduring value (Billington, Peterson & DiMario 1993).

On the basis of the specifications of the Joint Committee on Printing (JCP), Billington, Peterson and DiMario (1993) defined acid free permanent paper as:

- a fully bleached sheet with a pH of 7.5 or above,
- an alkaline reserve of two percent or more,
- a minimum MIT folding endurance in either direction of 30 double folds, and

- a minimum tearing strength in either direction of 25 grams for a 30 lb paper and proportionately higher tearing strengths for heavier papers.

This definition matches most closely the first specification for permanent paper, ANSI/NISO Z39.48 (1992), developed by the National Information Standards Organization of US, which has strong support in the archival and library communities in the US.

McCraith (1998) further characterized permanent paper for the production of enduring documents as follows:

- be new rag pulp, fully bleached chemical wood pulp, or a mixture of these two and should be purified pulp containing no recycled materials;
- contain no ground wood and lignin content should be less than one percent;
- internal and surface sizing of the paper should be neutral or alkaline, and sizing should not be alum rosin;
- should have an alkaline reserve of two-three percent calcium carbonate;
- must not contain extraneous particles of metal waxes, plastics, spot stains, surface imperfections (that is, knots), reducible sulphur, residual bleach, peroxides;

In describing permanent paper, McCraith (1998) demonstrated that despite the fact that “bond” is a grade of writing or printing paper historically used where permanence and durability were required, nowadays “bond” covers a wider range of quality and is used also for letterhead, forms and other uses where permanence and durability are less important than the appearance and printability of the stock. In a sense, at the moment “bond” is not a guarantee of permanence.

The use of acid-free paper can guarantee the permanence of materials for centuries. It would reduce remedial preservation measures like restoration and conservation, which are discussed in the subsequent section.

2.5.3 Restoration and conservation processes

Conservation and restoration are the most central activities of preservation; they are concerned with the physical maintenance and repair of documentary materials (Matthews 1990). According to Roberts and Etherington (n. d) conservation is a field of knowledge concerned with the coordination and planning for the practical application of the techniques of binding, restoration, paper chemistry, and other material technology, as well as other knowledge pertinent to the preservation of archival resources.

Conservation can be further characterized as both preventive and remedial. Preventive conservation consists of indirect action to retard deterioration and prevent damage by creating conditions optimal for the preservation of materials. On the other side of the coin, there is remedial conservation, which consists mainly of direct action carried out on documents in order to retard further deterioration. It is akin to restoration.

Restoration is the process of returning archival materials as nearly as possible to their original condition. Respecting, as far as possible, the aesthetic, historic and physical integrity of materials is the underlying principle that defines restoration activities. The entire scope of restoration ranges from the repair of a torn leaf, or removal of a simple stain, to the complete rehabilitation of the material including, at times, deacidification, alkaline buffering and resizing (Roberts & Etherington. n. d).

Conservation and restoration hinge upon diagnostic examination. Diagnostic examination encompasses determining the composition and condition of materials; identifying extent and nature of alterations; evaluating the causes of deterioration; and determining the type and extent of treatment needed (Roberts & Etherington. n. d).

The major conservation-restoration processes like deacidification, leaf casting, encapsulation, lamination and providing microenvironments are discussed in the following subsections. This section on conservation and restoration processes concludes by looking at conservation and restoration facilities, which are key to carrying out these interventive processes.

2.5.3.1 Deacidification

As discussed in section 2.5.1 above, acidity is the major cause of the deterioration of non-alkaline permanent paper. While brittle materials could be reformatted for preservation, there is also the troubling question of what to do about the millions of acidic but not yet brittle records and archives inexorably deteriorating in repositories. Deacidification is a tool that many archivists and records managers had anticipated could be used to help combat the serious problem of the acidic archival holdings. William Barrow, the well-known preservation pioneer, was responsible in part for the widespread acceptance of deacidification from the 1940s through the 1960s in both the library and archives communities (Jones 1999).

Valuable deteriorating documents are deacidified by treating the paper with a mildly alkaline solution (pH<10) that deposits a carbonate salt into the fibre of the paper. By adding 3% by weight of calcium carbonate the deacidification process may extend the life of a document as much as 500 years (Wachter 1989). A simplified deacidification procedure is outlined at Appendix Sixteen.

A number of techniques of deacidification have been developed. They range from item treatment procedures to mass processes. Though mass deacidification procedures are being developed and tested, deacidification in archives is presently at the item level. Most experimental work on mass deacidification has been confined to printed library materials at the exclusion of handwritten manuscripts that are very prevalent in archival collections.

Deacidification methods encompass aqueous (water based), non-aqueous (non-solvent) and vapour phase (Ritzenthaler 1993:144). Aqueous deacidification involves immersing or brushing affected paper with an alkaline solution or suspension (magnesium bicarbonate is generally regarded as the most effective) until the acidity has been neutralised and the pH value has been raised to between 7.5 and 9.0. After treatment any necessary repair is then undertaken and the paper is re-sized and pressed. Although, this method is tried and tested, it may not be safe for materials with water-soluble inks or very fragile documents. It is also a very slow, time consuming and costly process (Swartzburg 1995:140). The Wei T'o system described below is an example of non-aqueous system, except that it is being developed for mass deacidification processes.

Vapour-phase deacidification employs chemicals in gaseous forms to neutralise the acid; this is potentially easier to use and offers greater productivity than either of the processes described above. Unfortunately, most of the gases, which have been used, are poisonous or otherwise injurious to health and this system has been discontinued (The National Archives Of The Netherlands *et al.* 2001; Wachter 1989).

The cost and limitations of item-by-item treatment has led to the development of mass treatment procedures. Most of the procedures are still in the experimental or developmental stage. All require expensive plant; some require the use of a vacuum chamber, which may be safe for bound volumes but not always for loose sheets; others use chemicals which require careful handling if they are not to be a threat to health and safety. Most are likely to be cost-effective only where a high volume of work can be foreseen. Examples of mass treatment procedures are the Wei T'o system, the diethyl zinc (DEZ) mass deacidification gaseous process and the Bookkeeper® process. Each of the processes is presently briefly discussed.

The Wei T'o non-aqueous book deacidification system was invented by Richard D. Smith and developed by the National Archives in Canada. It is one of the world's leading deacidification systems (Herion 2000:48). The books to be deacidified are soaked in a mixture of freezing substances (frigen) as a transport medium and a deacidification agent magnesium methoxide dissolved in 5% methanol and a chlorofluorohydrocarbon solvent (Grimard 1994:676; Ritzenthaler 1993:145; Wachter 1989). Thus far the Wei T'o system has been for deacidifying books and not archives (Grimard 1994:677). Its use of alcohol precludes the treatment of documents with certain inks (Grimard 1994:677).

The Library of Congress developed the DEZ process in the 1970s under the direction of George Kelly (Harris 2000a:39; Swartzburg 1995:141). Books are placed in a slightly heated vacuum chamber in order to reduce the water content of paper. DEZ is then added. DEZ reacts with water to form a zinc oxide alkaline buffer. At the end of the procurement effort to obtain mass deacidification services in 1991, the expert advisory panel concluded that the DEZ process showed the greatest promise for meeting the Library's technical requirements. However, it was abandoned because it had some unacceptable flaws such as odour in treated

books, iridescent rings on coated paper and covers and chemical attack on some book covers and adverse effect on adhesives and labels (Harris & Shahani 1994).

The Bookkeeper® process, which was originally developed by the Koppers Company and patented in 1985, is now available from Preservation Technologies (Preservation Technologies 1994). In 1995, after working for over twenty years to solve the problem of acidic paper, the Library of Congress awarded the first contract for mass-deacidification to Preservation Technologies. The Bookkeeper® process differs from earlier, less successful, attempts to neutralize acids in paper because it does not use any solvents or gasses that can damage inks, adhesives, paper or binding fabrics. The microscopic buffer materials (magnesium oxide) are dispersed and suspended in an inert liquid (a blend of non-toxic, fluorinated materials).

Books are mounted in treatment cylinders, where magnesium oxide is deposited to neutralize acids in the paper. Books are exposed to the treatment chemistry for about 30 minutes. The treatment solution is then drained from the cylinder, and a vacuum is applied for about 90 minutes to evaporate and condense the liquid carrier (perfluoroalkane) from the books (Harris 2000a:44; Library of Congress 2001). No harmful chemical residues remain in the paper and there is no need for after-treatment to remove odours or humidification to restore moisture to the paper. Until recently, the Bookkeeper® process has remained the only deacidification technology fully operational in the United States (Harris 2000a:40). While the Bookkeeper® process is highly regarded in the USA, the Swiss regard the Battelle system which uses the non-aqueous solvent, magnesium titanium ethylate, dissolved in hexamethyl disiloxane as the best deacidification process (Herion 2000:48). According to Herion (2000:48), the Battelle system is suitable for both loose-leaf archive stock and bound library materials. Preservation Technologies has also developed new equipment that it is using to offer deacidification services for loose manuscript and archival materials (Library of Congress 2001).

Various deacidification technologies continue to be developed throughout the world. Institutions are actively involved in developing programmes to create mass deacidification processes in other countries such as Germany, The Netherlands, Switzerland, France, the United Kingdom, Canada, Japan, South Korea, and China (Harris 2000a:46).

Deacidification agents are as varied as the techniques. Through experimentation some deacidification agents like ammonia vapour (used extensively in India: Nehru Library) and morpholine vapour (developed by the W. J. Barrow Laboratories) were proved to be ineffective in depositing an alkaline buffer that is capable of inhibiting acidic build-ups (Ritzenthaler 1993:144). Some agents that are being developed and tested like DEZ and submicron magnesium oxide hold great promise.

However, deacidification is not a panacea for all paper preservation problems. While it is the most important process in the preservation of paper it does not decrease the probability of biological attacks as some fungi thrive in alkaline conditions. It does not prevent oxidation decay or photochemical reaction. It does not strengthen paper already embrittled by acid hydrolysis (Gwinn 1987:4; Jones 1999). Deacidification also raises the question of fastness of inks and pigments in the substances used as deacidification agents. Tests are necessary before deacidifying documents with inks and pigments.

In addition to deacidification, paper needs strengthening and support. Lamination, encapsulation and providing microenvironments are some of the ways used to stabilize and at times to support and strengthen paper. The following sections elaborate on these processes.

2.5.3.2 Lamination

William J. Barrow devised lamination in 1935 (McCrary 1993; Morrow & Dyal 1986:9; The National Archives of the Netherlands *et al.* 2001:63). It is a method of protecting and preserving embrittled or otherwise weak papers by placing them between sheets of thin, transparent thermoplastic material, which, when subjected to heat and pressure, with or without an adhesive, seals the paper in and protects it by making it more or less impervious to atmospheric conditions. It also increases its effective strength.

The paper is first deacidified and dried. It is then placed between two layers of cellulose acetate film approximately 0.001 inch thick. Layers of Japanese tissue or lens tissue are then placed over the film. The 'sandwich' is then subjected to intense heat (340-360 degrees Fahrenheit) and pressure (Morrow & Dyal 1986:9). Cold lamination can also be used instead of hot lamination (The National Archives of the Netherlands *et al.* 2001:63). The final product

is always a sheet slightly thicker and heavier than the original document and considerably stiffer and stronger. Lamination is an excellent method of improving the mechanical strength of documents, which are to receive considerable handling, but it also has both real and potential disadvantages. Unless the document is properly and adequately deacidified before it is laminated, it will continue to deteriorate despite the illusion of protection afforded by the laminating film.

In some archives and libraries lamination has been regarded as an appropriate method of last resort for much twentieth century material, since it can be carried out by semi-skilled, and therefore comparatively cheap labour; but it suffers from the inherent disadvantage of using heat or materials which have to be used with extreme care to avoid hazards to archival documents (Morrow & Dyal 1986:9). When lamination was first introduced, the term became almost synonymous with preservation (The National Archives of the Netherlands *et al.* 2001:63). However, it has been overtaken by encapsulation. Lamination can no longer be considered a practical solution for preserving documents of enduring value (Rhys-Lewis 1999:164).

Unlike encapsulation, lamination is not instantly and completely reversible. The polyester film used in encapsulation is a stable, inert substance that is widely available (Morrow & Dyal 1986:9). Many institutions gave up lamination in favour of encapsulation in the early 1970s when the Library of Congress dropped it (McCrary 1992). Several delaminating projects have been undertaken worldwide to restore documents that were badly damaged by lamination in the 1960s and 1970s (The National Archives of the Netherlands *et al.* 2001:63).

2.5.3.3 Encapsulation

Encapsulation has been defined as a form of protective enclosure for paper and other flat objects. It involves placing the item between two sheets (or one folded sheet) of clear plastic film (usually polyester) that are subsequently sealed along four edges. A sheet of buffered paper or board is sometimes included to increase support (Adcock. n. d). Encapsulation protects documents from physical wear and tear caused by frequent handling. Encapsulation is a technique of enclosing fragile, brittle, vulnerable, or damaged flat paper documents in a polyester film envelope (Morrow & Dyal 1986:9). It protects documents from air, dirt, and

loss of text through breakage. Thus, the items can be safely handled by patrons without fear of damage. A conservator can also use encapsulation to store brittle or damaged papers before corrective treatment.

Encapsulation in Mylar was developed at the Library of Congress as an alternative to cellulose acetate lamination (McCrary 1993). It is a means of protecting fragile and damaged documents by sealing them between sheets of neutral polyester. Unlike lamination, polyester encapsulation is reversible and can be removed at any time with absolutely no risk to the document. Encapsulation can be instituted by sealing all the four edges of the polyester using an Ultrasonic Welder for polyester encapsulation or a double-sided tape recommended for archival purposes. Alternatively, polyester film enclosures of the U-seal (three-sided seal) or the L-seal (two-sided, one corner joined) type could be used.

Encapsulation does not stop a chemically unstable document from deteriorating. Thus, as it is the case with lamination, documents that are to be encapsulated should be deacidified first. This makes encapsulation a less attractive option because deacidification is risky and expensive for non-conservators to do, and time-consuming for conservators (McCrary 1993). Buffering an acidic document before permanent storage in an encapsulation is also recommended to slow down the future rate of deterioration. A buffered backing could be inserted in the enclosure if the document cannot be deacidified (McCrary 1984).

2.5.3.4 Microclimates

A microclimate has been characterised as any variation from the prevailing temperature and relative humidity of the surrounding environment (Wood Lee 1988). Microclimates or protective enclosures protect documents against rapid fluctuations in temperature and humidity, dust, light, atmospheric pollutants and mechanical damage (Mackenzie 1995:133; Morrow & Dyal 1986:10; Shahani, Hengemihle & Weberg 1995:67; Weintraub & Wolf 1995:123). Specifically, a microclimate, or a microenvironment has been defined as an, “isolated environment within a small enclosed space such as an exhibit case, closed cabinet, drawer, box, or other container” (Weintraub & Wolf 1995:123).

Protective enclosures include folders, boxes, envelopes and polyester film. According to Mackenzie (1995:133) all records and archives other than bound volumes should be put into some form of secondary enclosure. Since protective enclosures do not stop ongoing deterioration, they have to be used for protecting treated documents (Gwinn 1987:28). If treatments for a particular document are in doubt protective enclosures are preferred to using a method that could further damage the document.

Protective enclosures are fundamental to protecting documents with intrinsic value. Documents with intrinsic value dictate their retention in original format. Unlike other conservation treatments, protective enclosures do not obscure important features of a document. They can also be used when an archival institution does not have resources to restore damaged documents. According to McKern (1999) enclosures are used when items are not bindable; brittle but serviceable; and are in need of extra protection.

The best protection for documents is the closed box (Duchein 1977:81; Peters 1996:9). Recently, Passaglia (1987) studied microenvironments with specific reference to storage in the National Archives and Records Administration (NARA) and confirmed that closed boxes were valuable to the protection of materials. Passaglia (1987) presented models and calculations to estimate the effectiveness of various containers for protection of archival materials from environmental pollutants.

2.5.3.5 Conservation and restoration facilities

The implementation of the conservation-restoration processes described above largely depends on the existence of suitable facilities. According to Duchein (1977:54) setting up a modern archive repository without some conservation workshops is inconceivable. A viable conservation and restoration programme should be supported by facilities such as a bindery, a restoration workshop, reprographic laboratory, equipment and materials (Duchein 1977:54; Khayundi 1995:33; Mbaye 1995:43). Most archival institutions surveyed by Mbaye (1995) did not have technical workshops to carry out conservation and restoration activities. In some SSA countries conservation workshops exist, but most of the equipment has broken down due to

lack of maintenance and the difficulty of getting spare parts due to foreign currency constraints (ESARBICA 2002; Khayundi 1995:33; Mbaye 1995:43).

No amount of training or policy making in the field of preservation can facilitate conservation treatment in the absence of basic preservation facilities like workshops. For instance, in 1978 Mr Ranbir Kishore, an expert in conservation from India, could not demonstrate most conservation techniques when he was brought to Kenya to assist in conservation training because there were no basic conservation and restoration facilities in the country (Matwale 1995:49).

2.5.4 Inks and the preservation of paper-based records

It is often the combination of ink and paper that determines the life span of the information contained in records and archives. In creating records of enduring value the ink should be carefully selected as it influences the preservation of information. According to Ritzenthaler (1993:32) archivists should be aware of the common inks as well as their characteristics. Although, there has been limited research on the effect of ink on archival materials, it is apparent that inks have a potential to fade due to prolonged exposure to light (Ritzenthaler 1993:32; Thomas 1990a). They can also bleed or transfer if exposed to moisture. They can also weaken the paper.

For instance, the W. J. Barrow Research Laboratory (1967) found that the printed areas of 19th century book pages were weaker than the unprinted areas. The chemists at the W. J. Barrow Research Laboratory summed up their findings as follows:

While writing ink used in the nineteenth century is known to be injurious to paper because of its sulfuric acid content, conclusions from this study indicate that printer's ink did no visible damage to the nineteenth century papers tested. There was, however, a loss of 30% in folding strength due to encrustation of the ink and some loss in 13% of the papers due to injurious ingredients (other than carbon and oil) in the ink (W. J. Barrow Research Laboratory 1967:37).

Over centuries, people have used a variety of ink types such as carbon, iron gallotannate, copying, modern manuscript, printing, typewriter ribbon, non-impact printing and ballpoint

pen inks to records their activities and thoughts. Nowadays, most documents are created using typewriter ribbon, non-impact printing and ballpoint pen inks. Archivists should be concerned with research into the stability and permanence of these inks so that they can recommend the right ink to record creators (Thomas 1990a).

There must be thousands of printing inks sold today, and ink manufacturers can be expected to change the formula whenever they believe this would improve the product. So it would be risky to generalize about the stability and permanence of inks now on the market, except to say that there have been no reports of really destructive printing inks lately. Experience has shown that printing ink is normally long lasting and that the major threat to documentary materials is the quality of the paper and not the quality of the ink. On the other hand, standards for inks for duplicators are not archival and the process does not appear to be capable of creating permanent records.

2.6 PRESERVATION OF VULNERABLE RECORDS AND ARCHIVES

Vulnerable records and archives include magnetic tapes, floppy and stiffy disks, photographic prints and films (National Archives and Records Administration 1996). These records can further be characterized as audiovisual and electronic documents. There are significant challenges associated with ensuring access and preservation of these materials into the future as compared with paper. According to Klijn and de Lusenet (2000:1):

The preservation of paper collections for future use is daunting task, but the situation has become infinitely more complex with the introduction of modern carriers like tape, film, videos and disks into the collections.

This section examines the preservation challenges to preserving electronic records and audiovisual formats or modern carriers of information, as Klijn and de Lusenet (2000:1) would call them.

* 2.6.1 Preservation of electronic records

Electronic resources regardless of whether they are created initially through digitisation or are “born” digital are threatened by technological obsolescence and physical deterioration. Changing technology has created new problems and responsibilities for information safekeepers. Technological obsolescence occurs when technological changes cause technology

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to be outdated. Newer versions of software and hardware usually render older versions obsolete. As a result information, which relies on obsolete technologies, becomes inaccessible. Currently, it seems that the lifetime of digital storage media generally exceeds the life of the technology that supports it. Technological advances make it highly unlikely that today's digital storage media such as hard drives, CDs and DVDs would be easily accessible in a decade, let alone in 50 or 100 years (National Library of Australia. n. d). We need to devise strategies for the preservation of digital records and archives. As Brindley (2000) pointed out, "we can no longer rely on benign neglect" as a preservation option in this world of digital preservation.

Electronic records include digitised images generated by document scanners as well as character-coded data or text produced by word processing software, electronic mail systems, or other computer programs. Preservation is often regarded as the most difficult area in the management of digital material. Digital preservation is an emerging discipline so unambiguous communication is difficult. People use the same terms differently across and between sectors. The term "digital materials" refers to information sources in digital form, including converted materials and electronic records. The definition encompasses materials originally in digital form (also called "born-digital" and "electronic records") as well as digital surrogates of analog materials created for access and preservation purposes through the use of imaging and recording technologies (Hedstrom & Montgomery 1998). Electronic records and digital records are used interchangeably in this section and refer to one and the same thing.

Electronic resources are becoming a significant part of our cultural and intellectual heritage. The exploitation of digital technology to:

... produce documents, databases, and publications of all kinds has led to an impending crisis, resulting from the absence of available techniques for ensuring that digital information will remain accessible, readable, and usable in the future. Deposit libraries as well as other libraries, archives, government agencies, and organisations must find ways to ensure the longevity of digital artefacts or risk the loss of vast amounts of information and human heritage (Rothenberg 2000 cited in Brindley 2000).

Despite the fact that digital documents are becoming prevalent, many organisations have not addressed the issues of long-term preservation and use of digital information in a serious fashion (see Rubin 1998:429). A survey commissioned by the Research Libraries Group (RLG), a not-for-profit membership corporation of over 160 universities, national libraries, archives, historical societies, and other institutions with remarkable collections for research and learning, investigated the digital preservation needs of member institution revealed a glaring lack of:

...policies or even codified practices for preserving “born-digital” and converted-to-digital materials but virtually all those surveyed expect such preservation to be part of their operations by 2001 (Hedstrom & Montgomery 1998).

The United States seriously started to address digital preservation in 1999 (Hickerson 1999). Back home, most countries in Sub Saharan Africa are not seriously addressing the issues related to the preservation of digital records (Harris 2000b:31; Katundu 2001:180; Mazikana 1997:153; Ngulube 2001b). Even though the developing world has made significant strides in preserving digital materials, until recently, the emphasis has been on specific institution-based projects rather than on developing a digital preservation agenda at both the national and international level (Brindley 2000).

According to Brindley (2000) and Jones (2000), the impetus to preserve digital materials was given by the US Taskforce on Digital Archiving seminal report (Task Force 1996). As a result of the impact of the work of the US Taskforce, the Joint Information Systems Committee (JISC) and the British Library in the UK sponsored the first workshop on digital preservation (Long-term preservation of electronic materials 1995). Thereafter, a series of research reports were commissioned by JISC and the National Preservation Office (NPO) which served to highlight various aspects of digital preservation (Jones 2000). On the other hand, the UK government led initiatives to fund digitisation programmes⁶ in order to facilitate more efficient and effective utilisation of digital technology (Jones 2000).

⁶See New Opportunities Fund website at: <http://www.nof-digitise.org/guide.htm>.

2.6.2 Issues related to the preservation of digital records and archives

Paper may seem fragile and ephemeral as a means of preserving information, but its virtues are apparent when compared to data stored digitally. At a mundane level, despite all the potential advantages of digital technologies, “at the level of use analog technologies are better suited to the needs of human beings” (Lynn 1998:57). Analog documents have almost exclusively used ink on paper as the information storage medium, and require no special technology to access the recorded information.

Nowadays, vast amounts of information are created, stored and accessed electronically, bringing with it enormous advantages. But digitally stored information brings its own preservation problems. Some of the issues relating to the preservation of digital records and archives that have been identified are accessibility; technological obsolescence; research; and training and expertise (Hedstrom & Montgomery 1998). The subsequent sections explore these issues in more detail.

2.6.2.1 Preserving access to digital materials

Technological advancement means there is a real danger that digital material will become inaccessible because of software and hardware changes. According to the Society of American Archivists (n. d):

preservation of digital information is not so much about protecting physical objects as about specifying the creation and maintenance of intangible electronic files whose intellectual integrity is their primary characteristic.... Preservation goes beyond saving such media as optical disks or magnetic tape; the access system itself must be preserved.

Preserving access is key to facilitating the long-term utilization of digital objects. According to Battin (1993):

As we have explored the uses of digital technology to preserve the deteriorating printed documents of the past, we have discovered the paradigm of the future virtual libraries [and archives]: in the digital world, preservation is access, and access is preservation. The boundaries of analog world have dissolved (Battin 1993:367).

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Traditionally preservation has always focused on the longevity of the physical medium on which the record is stored. Preserving digital records and archives raises a different set of issues to preserving paper records. Preserving electronic records needs a different approach. Paper records share a common characteristic, they are 'human-readable', and they can be stored in one physical place as on a paper page. Paper records have a fixed location, whereas electronic records are represented in the hardware and software as bit streams. As opposed to paper, the electronic records' storage media are very fragile. The useful life of magnetic tape is estimated at a year, magnetic disks at 5 to 10 years, and optical disks at 30 years (Balas 2000; McInnes 1998; Pace 2000). As yet, no digital medium offers the life expectancy of permanent paper (Crawford 1999).

Unlike paper records, electronic records on their own do not have a recognizable form. Software and equipment are required for digital information to have a form. The major concern is the preservation of the access method and the record rather than the storage media per se. In that regard:

the archivist's strategy must be directed at maintaining the processibility of electronic records over time, rather than merely the preservation of the physical storage media (Kirkwood 1994:12).

In addition to "processibility", archivists should consider the issue of technological obsolescence. Digital information has been produced in a wide variety of formats, each with its own type of risk for long-term preservation.

2.6.2.2 Technological obsolescence

It is generally accepted that the rapid changes taking place in the development of digital technologies should be the main focus of any preservation strategy (Beagrie & Greenstein 1998; Kirkwood 1994; Task Force 1996). Rapid technological changes threaten to render the life of information in the digital age as, to borrow a phrase from Thomas Hobbes, "nasty, brutish and short" (Hobbes 1952: 85). In support of this view Marcum (1996) stated that:

rapid change in the means of recording information, in the formats for storage and in the software for use threaten to shorten the life of information in the digital age in a

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few years. The threat is that much digital information will be, if not already, lost (Marcum 1996:452).

Technologies are changing very fast, for instance, punched card readers are now “nonexistent”. Five and quarter floppy disk drives are now obsolete and becoming difficult to locate or use in conjunction with the generation of personal computer hardware and software used in 2000. This means that, data stored on 5³/₄ floppy disks has become inaccessible on many modern personal computer systems. The British Broadcasting Corporation (BBC) recently encountered this problem when it found that its £2.5m multimedia Domesday disk could no longer be opened, just 16 years after its creation (Beagrie 2002).

The case of the 1960 Census files in the United States of America, which were stored on an electronic media that could not be read by existing technology, also demonstrates how technological obsolescence can render records unusable (Task Force 1996). The National Archives of the United States selected some of the 1960 Census files in 1976 as records of enduring and evidential value. However, it was discovered that the files were on tapes that could only be read using a UNIVAC type II-A tape drive. By that time, there were only two machines in the world capable of reading those tapes: one in Japan and the other on museum display in the Smithsonian Institution (Task Force 1996).

In Zimbabwe the Salary Service Bureau, a government department that is responsible for processing civil servants’ salaries and pensions, lost all the information created and stored on computer tapes between 1980 and 1994. The problem only surfaced when a newly introduced computer-based information system could not read most of the older computer tapes (Cain & Thurston 1998:30).

Though technological obsolescence seems to pose the greatest single threat to the preservation of electronic records, many solutions to the problem have been suggested. The examples of potential solutions are:

- maintaining “computer museums” for obsolete technologies;
- emulating obsolete technologies in new computer products and systems (Rothenberg 1995; 1999:15);

- medium refreshing and conversion (Bearman 1989:21; Lesk 1990:5); and
- making sure data is migrated to new hardware and software technologies as old technologies become obsolete (Beagrie & Greenstein 1998; Hazen, Horrell & Merrill-Oldham 1998:14; Task Force 1996).

Prohibitive administrative and management costs make it inconceivable for archivists to create museums of hardware and software. The second main suggested approach to digital preservation is technology emulation. This strategy relies (as with technology preservation) on the preservation of the original data in its original format. Instead of preserving the host software and hardware, software engineers would build emulator programs that would mimic the behaviour of obsolete hardware platforms and emulate the relevant operating system (Rothenberg 1995). In practice, data is encapsulated together with the application software used to create it and a description of the required hardware and software environment, thus facilitating future use.

While, emulation is an important preservation strategy, Hendley (1998:18) cautioned against relying solely on this approach because it is largely dependant “on the technical ability of the software engineers to emulate a specific environment and sustain it”. In addition, data conversion can compromise the cleanliness and quality of data (Phillips 1999:57).

Among the suggested technological answers to digital preservation, migration seems to be the preferred solution. Migration is the periodic transfer of digital materials from one hardware and/or software configuration to another, or from one generation of computer technology to a subsequent generation. According to the Research Libraries Group migration is a broader and richer concept than "refreshing" for identifying the range of options for digital preservation (Task Force 1996). Unlike the other options migration guarantees the preservation of the integrity and usability of electronic records in the face of constantly changing technology.

Digital objects are transferred to new formats while, preserving the integrity of the information. Thus, a digital archive could convert incoming digital objects into ‘standard’ formats. For example, textual data could be stored in a relatively software independent format

like ASCII, in widely used proprietary formats like the Portable Document Format (PDF) or in formats based on applications of SGML (Coleman & Willis 1997).

Although data migration seems the most popular preservation strategy, it can be expensive (McInnes 1998). To minimize the costs of migration, electronic records and archives should be re-appraised from time to time to justify the need to maintain them in a digital format. Control over the creation of electronic records is difficult because of the intricacies involved in their creation. The long-term solution seems to lie on research into cheaper preservation solutions.

2.6.2.3 Research

The world of electronic information is still at an embryonic stage in terms of preserving digital information (Task Force 1996). The archival professionals are not yet fully conversant with the opportunities and challenges of preserving digital records. It was in this light that the International Council on Archives (ICA), the professional organization for the world archival community, dedicated to the preservation, development and use of the world's archival heritage, established the ICA's Committee on Electronic Records in 1993 to "undertake study and research, promote the exchange of experience and draft standards and directives concerning the creation and archival processing of electronic records" (International Council on Archives 2000a).

Although archives in the developing countries have problems of limited resources, they need to do extensive research on existing preservation strategies and policies. Open systems development should be further explored as well as independent format like ASCII and proprietary formats like the Portable Document Format (PDF) or SGML formats, as they are likely to offer answers to the problem of obsolescence. Research into requirements and standards for describing and managing digital information should be done as a priority because there are no established procedures and standards for preserving digital information (Balas 2000).

The International Standards Organization (ISO) appreciates the need for research into these areas. Its Technical Committee 20 and its subcommittee SC-13 are actively "investigating the

feasibility of developing standards for long term data archiving” (International Standards Organization 2000). However, it should be emphasized that the exercise should not be done in isolation. It should take cognisance of existing record keeping and information management regimes. The development of standards could, in a way, preserve the integrity and accessibility of electronic records indefinitely.

2.6.2.4 Training

Lack of trained staff in the preservation of electronic records is bound to erode the strides that have been made so far in preserving the archival heritage. The need for expertise in managing digital resources was identified in a study for the Research Libraries Group (RLG) as a major factor in the successful management of digital materials (Hedstrom & Montgomery 1998). Expertise in the management of digital objects hinges upon training. Training in the area of digital preservation and electronic records is a very critical issue in Africa because there are very few experts in this field. Furthermore technological development, and the unsettling effect it produces, calls for continuous reassessment of records and archives management training. Kemoni and Wamukoya (2000:134) identified lack of information (IT) skills due to inadequate training as one of the impediments to the management of electronic records at Moi University in Kenya. Training and education as they relate to preservation are dealt with in greater detail in sections 2.12 below and 3.2 in Chapter Three.

2.6.3 Audiovisual records and archives

The use of audiovisual (AV) media is becoming very prevalent in our society (Forgas 1997:43; Wilkie 1999:1). However, the archival community has largely ignored audiovisual formats (Paton 1990:274). Even the Society of American Archivists’ classic manual on preservation by Ritzenthaler (1993) does not do justice to the subject. In fact, very little relevant literature on the subject is found in standard archival sources. For instance, a cursory perusal of The American Archivist in the period 1960 to 2001 only yielded three articles on the subject. The same cannot be said of the ESARBICA Journal or the S. A. Archives Journal where there is virtually nothing on the subject. In addition, the knowledge of what is available in audiovisual formats, who has produced them and where they can be obtained is very haphazard (Kofler 1991:23).

The definition of audiovisual formats is fraught with problems as new technological developments result in even more formats (Feather & Sturges 1997:22). Audiovisual materials include audio and video recordings, films, microfilm, computer software, photographs and slides (Cornish 1992:25; Pinion 1992:198). The size of the audiovisual production is far greater than that relating to printed materials (Pinion 1992:198). Film-bases such as cellulose nitrate, cellulose acetate, and polyester have been used as a support for negatives, positive transparencies, motion pictures, microfilms, and other photographic products. On the other hand magnetic tape has been used in audio and video recordings, and computer software in conjunction with film. Most of these carriers are very fragile.

Audiovisual materials are made up of polymers such as cellulose, polyester and PVC. All polymers deteriorate and they have an uncertain life expectancy (Harrison 1992:217). Many institutions are faced with a crisis in the preservation of the audiovisual materials due to the rapid development of digital data and the phasing out of analog and video magnetic tape.

Although, traditional techniques of managing text-based information are not fully applicable to audiovisual media, audiovisual materials present many of the same preservation challenges as resources on paper (Wilkie 1999:1). Perhaps, the major difference between paper-based records and most audiovisual materials is that the latter are machine-readable. In most cases the master original is only used for copying. Viewing and listening is done from copies (Harrison 1992:217).

Audiovisual materials that have deteriorated are difficult to restore. Emphasis should therefore be put on preventative measures. They include correct handling, filing and proper storage (Harrison 1992:213; Murphy 1997). Like paper records and archives, audiovisual materials are affected by temperature, humidity, light and dust. The level of light, temperature and humidity should be controlled and monitored. Storage areas must be kept clean. In addition, precautions should be taken against physical damage, especially, in handling of materials.

The other facets of the preservation of audiovisual materials include providing for its proper restoration and periodic transfer to modern formats before the original or next generation copy is no longer technologically supportable, and continuing protective maintenance of at least a

master and a copy, physically separated in storage, preferably in different geographic locations (Murphy 1997). However, the preservation of photographs is not primarily affected by technological obsolescence. In that light, photographs need a slightly different approach from other audiovisual formats. Issues relating to preserving photographic formats are dealt with in the next section followed by sections on films and magnetic tape.

2.6.3.1 Care of photographic materials

Large quantities of photographic records exist in most archival institutions (Hendriks 1990). Photographic materials have complex physical and chemical structures that present special preservation challenges to the records manager and archivist. Since the birth of photography in the late 1830s, many different photographic processes and materials have been utilized, each subject to deterioration through time and with use. The fact that many of the early photographs have survived is proof that black and white photographs can, theoretically, last for hundreds of years. Although the typical colour films and prints of today last longer than those of a few years ago, they are not as permanent as black and white (Adcock. n. d; McColgin 2002).

Although deterioration is an ongoing natural process, nevertheless much can be done to slow the rate at which it takes place in photographic images. Proper handling and storage could increase the life expectancy of a photo collection. Photographs are made so that they could be viewed, and that is one of the main reasons why many do not survive. Viewing a picture requires light and frequently involves handling, both of which can result in damage. All light damages photographic materials to some degree, so it is best to store them in complete darkness (Murphy 1997).

A typical photograph consists of the support, emulsion or binder and final image material. The support layer may be of glass, plastic film, paper, or resin-coated paper. The emulsion or binder layer, most commonly gelatine, but also albumen or collodion, holds the final image material or image-forming substance to the support. The final image material, made of silver, colour dyes, or pigment particles, is usually suspended in the emulsion or binder layer. Nowadays, the commonly used final image materials and binders are composed of silver suspended in gelatine (Murphy 1997).

Four principal factors that contribute to photographic deterioration are the stability of the support, the presence of residual photographic processing chemicals, poor environmental storage conditions, and rough or inappropriate handling that results in unnecessary wear and tear (Ritzenthaler 1993:38). Unfortunately, archivists have little control over the processing of photographs. Processing involves development, fixation and drying. Once the photographs are in their custody, archivists should provide copies rather than originals whenever possible in order to minimize damage of the originals. The destruction of organic dyes in colour photographs through oxidation or hydrolysis is said to be irreversible, and making duplicate copies and placing them into cold storage could save such pictures (Hendriks 1990).

Photographic media are exceptionally sensitive to environmental factors. The storage conditions should take into consideration temperature, humidity and other environmental conditions that accelerate the aging of documentary materials. These factors are dealt with in section 2.8 of this chapter. It would suffice to point out that storage temperatures and humidity for photographs should be kept as low as possible and measures should be taken to reduce exposure to light, ultraviolet (UV) radiation, and particulate pollution. Black and white prints and negatives should be kept below 18 °C and 30–40% relative humidity (RH). On the other hand, colour material should be placed in cold storage, that is, below 2 °C and 30–40% RH (Adcock. n. d; Hendriks 1990).

2.6.3.2 Nature of film and magnetic tape

Current realities in film preservation have been shaped by the history of film itself. From the 1890s to 1950 most films (35mm format) were made on cellulose nitrate plastic supports. The manufacture of cellulose nitrate film ceased in the 1950s. Cellulose nitrate film base is chemically unstable and highly combustible. Cellulose nitrate films are not acceptable for archival records. When the manufacture of nitrate film ended, two advances in film technology occurred almost simultaneously.

One was the replacement of nitrate with non-flammable cellulose acetate plastic film support. Acetate film refers to any film having a base composed of cellulose diacetate, cellulose triacetate or the mixed esters (Eaton 1970:86). Acetate films are considered to be safety films. The acetate base differs chemically from nitrate base. It is neither particularly inflammable, nor

does it emit obnoxious gases. Unlike acetate films, the nitrate base decomposes even under favourable storage conditions, and in the process gives off harmful gases, especially nitrogen dioxide. The nitrate gases released by decomposing nitrate film combine with the moisture content of the gelatin to form nitrous acid or nitric acid. These two acids bleach the silver image, or colour picture, in the emulsion and also accelerate the decomposition of the base to the point of total destruction.

With the advent of acetate film the focus of preservation activities came to be a systematic programme of nitrate duplication as a pre-emptive measure, before deterioration occurred. Attitudes toward preservation were shaped by the conviction that acetate stock was permanent, while nitrate was not. We now know that acetate and nitrate both share a tendency to degrade; in fact, in some collections, the losses from acetate decomposition are greater than from nitrate (Murphy 1997). Nature does not distinguish much between cellulose nitrate and cellulose acetate when it comes to deterioration.

The second key innovation of the early 1950s was the introduction of chromogenic colour motion picture stocks, to replace the technicolor process of the 1930s and 1940s. The use of colour introduced a new problem of rapid colour fading. The instability of organic colour dyes, like the decomposition of nitrate and acetate film base, results from a chemical process, which can be speeded up or slowed by the temperature and humidity of the storage environment. Warm and humid conditions accelerate the rates of fading and decomposition, while cool and dry conditions greatly slow the reactions.

Hitherto, preservation concerns had been mainly focused on nitrocellulose film, cellulose acetate film deterioration, and the impermanence of colour film, but the prevalent use of magnetic tape created a new dimension to the preservation challenge. Films and magnetic tapes are the least stable materials (Murphy 1997; van Bogart 1995). However, as opposed to film and paper, magnetic tapes will only last for a few decades even if they are properly cared for. In addition, information on media life expectancy of magnetic tape is largely undocumented, and a standard method for determining magnetic media lifetimes has yet to be established (van Bogart 1995). According to manufacturers' data sheets and other technical literature, thirty years appears to be the upper limit for magnetic tape products, including video and audiotapes.

The problems associated with preserving magnetic tape and its impermanence prompted Murphy (1997) to point out that: “Next to nitrocellulose film, videotape is probably the next best medium for a society which did not wish to be reminded of its past”.

The prevalence of several formats, media pigments and rapid advances in media technology cause major difficulties in the use of magnetic media for storage. Magnetic tape formats include U-matic, VHS, S-VHS, 8mm, and BetaCam for video. Murphy (1997) argued that in actual fact there are over 100 formats. At the moment formats seem to change every four or five years with a bewildering array of incompatible options (Murphy 1997). Once a format has been abandoned, machinery will rapidly become scarce and even spare parts will become difficult to find after a few years. A particular format requires a particular machine for playing. For instance, since 1956 over 30 different videotape formats, each requiring a special machine, have been used (Calmes 1990). Beta (tm) spare parts, for example, are already scarce (Calmes 1990). The rapid technological changes in video formats that have taken place since 1956 have made archivists and technical experts conclude that the major problem of video preservation is how to cope with technological obsolescence.

Some of the factors affecting the life of audiovisual formats over which archival institutions have some control are: handling and care, the quality of the conditions in which they are stored, the number of times the materials are accessed during their lifetime (master copies should not be used for viewing), variation in the quality of the manufacturer; for example, a name brand versus a bargain brand and future availability of system technology to play back the tape (for example, quadruplex videotapes still exist in archives; however, the equipment to play them back is considered obsolete, and it is difficult to find working recorders). According to St-Laurent (1996), there are essentially only three concerns to consider when handling and storing audiovisual formats that:

- they be kept free of any foreign matter deposits;
- they be kept free of any pressure that might cause deformations; and
- they be stored in a stable, controlled environment.

The care and storage of audiovisual formats are covered in the ensuing sections.

2.6.3.3 Effects of environmental factors on audiovisual formats

Environmental conditions have a significant impact on the life of audiovisual formats. Relative humidity, temperature, time, light and chemical pollutants in the atmosphere affect films and magnetic tape. Audiovisual formats can be scratched. Chemicals or heat can blister them. They can be damaged by prolonged exposure to the sun. They get brittle in cold conditions.

Excess moisture will accelerate castor oil plasticizer loss in acetate discs. The gradual loss of plasticizer causes progressive embrittlement and the irreversible loss of sound information (St-Laurent 1996). Acetate discs are very susceptible to fungus growth that might be precipitated by humid conditions. The emulsion layer for the optical recording of both picture and sound is comprised of gelatin, an organic product that is an excellent nutrient for fungi. Fungi can penetrate the emulsion layer and destroy the image (Volkman 1980:17). While vinyl discs are resistant to fungal growth and are unaffected by high humidity levels, they are adversely affected by ultraviolet light and high temperature. Heat fluctuations result in cumulative irreversible deformation.

Elevated levels of light, heat and humidity adversely affect vulcanite discs. In response to light and heat, vulcanite loses sulphur. Light induces oxidation and forms oxides of sulphur and sulphuric acid in the presence of humidity. High humidity levels accelerate the embrittlement of shellac discs. This embrittlement causes a fine powder to be shed from the disc after each playback, effectively scraping away groove information (St-Laurent 1996).

In magnetic tape, hydrolysis, a chemical process that causes water vapour to react with artefacts, results in the binder shedding a gummy and tacky material which causes tape layers to stick together making playback when it is deposited onto the tape recorder heads almost impossible. Hydrolysis also causes a weakening in the bond holding the binder to the backing, which results in shedding or possible detachment (St-Laurent 1996; van Bogart 1995).

The compact disc (CD) is a laminate of four different materials. The bottom of the disc is made of polycarbonate onto which the pits containing the digitised sound information are stamped. A thin layer of aluminum is then applied, covering the pits. A thin lacquer coating (which becomes the top of the disc) is then applied to cover the aluminum layer, and finally

the ink for the labelling. Digital Versatile Disk or Digital Video Disk (DVD), which is part of CD technology, is taking the market by storm. DVD is a new video format for storing full-length motion picture images on a 5" (120mm) compact disc (CD) using compression (Screensound Australian 2001). It is the same size as a CD but stores from 4.38 GB (seven times CD capacity) on a single sided, single layer disk. DVDs have an estimated life span of 100 years and they are considered to be better than VHS in terms of use of space and quality of the image. However, the aging characteristic of all CD material is affected by humidity, light, dust and temperature affecting adjacent layers. Storage conditions are key to lengthening the life span of AV formats. The following section deals with the storage of films, magnetic tape and other AV formats.

2.6.3.4 Storage of films and magnetic tape

The key to the preservation of audiovisual materials is correct storage (Wilkie 1999:25). Phonograph records, cassette tapes, and reel-to-reel tapes should be stored upright whenever possible at the same time making sure that they do not sag or bend on the shelves. The storage environment, together with storage enclosures such as sleeves, boxes, cans, and cabinets, can be used to extend the useful life of video formats. Studies carried out at Rochester's Image Permanence Institute (IPI) between 1988 and 1990 clearly demonstrated the influence of storage temperature and RH on the long-term stability of acetate films (Reilly 1993). The results published by Reilly (1993) predicted the life span of new and already degraded films under different combinations of RH and temperature. IPI undertook another Arrhenius⁷ research project on acetate films between 1991 and 1994 and arrived at the same conclusions as Reilly in 1993 (Reilly, Nishimura & Zinn 1995:28).

A proper environment for the storage of films is essential to retard degradation mechanisms. Current research seems to suggest that storage conditions for film should be colder and drier than was previously believed, but there is no agreement as to the exact ranges for temperature (Wilkie 1999:26). The speed of chemical processes is temperature dependent: the higher the temperature, the faster the chemical process. For instance, the rate of decomposition of cellulose

⁷ Arrhenius testing is an accelerated aging test named in honour of a nineteenth-century Swedish chemist. Arrhenius testing uses accelerated aging to determine how temperature affects reaction rate. In such tests, RH is kept constant while temperature is being varied (Reilly 1993).

nitrate films roughly doubles with every increase of six degrees centigrade; so the higher the storage temperature, the faster the film will deteriorate. Storage temperatures therefore need to be as cold as possible (Screensound Australian 2001). In addition, the relative humidity must also be as low as practicable to slow down the deterioration of nitrate materials. At higher temperatures and humidities nitrogen dioxide gas is more quickly formed which reacts with water in the atmosphere and in the photographic emulsion to form nitric acid, which will cause the film to deteriorate. Nitrogen dioxide (NO_2) reacts with water as follows: $2 \text{NO}_2 + \text{H}_2\text{O} \rightarrow \text{HNO}_3 + \text{HNO}_2$.

According to the International Federation of Film Archives (FIAF) the storage temperature of cellulose nitrate film must be 4°C (39°F) $\pm 1^\circ\text{C}$ and a RH of 50% $\pm 2\%$ on a daily basis. On the other hand, the storage temperature of cellulose acetate should be less than 20°C (68°F) $\pm 1^\circ\text{C}$ and a RH of 35% $\pm 2\%$ on a daily basis. Colour film requires a temperature of minus 5°C (23°F) $\pm 1^\circ\text{C}$ and a RH of 30% $\pm 2\%$ on a daily basis. Each 6 degrees Celsius increase in temperature halves the life of the materials (Screensound Australian 2001). Magnetic materials should be stored at temperatures and relative humidities of 20°C $\pm 2^\circ\text{C}$ and 20% to 30% $\pm 5\%$ or 15°C $\pm 2^\circ\text{C}$ and 20% to 40% $\pm 5\%$ or 10°C $\pm 2^\circ\text{C}$ and 20% to 50% $\pm 5\%$ respectively. A lower storage temperature can compensate for a higher humidity to provide the same life expectancy to materials and a wider relative humidity range can also be tolerated.

In addition to providing ideal storage conditions, preservationists should inspect their audiovisual holdings constantly. Nitrate films should be inspected annually (Volkman 1980:42). All the other materials can be inspected every two to five years. The inspection takes place at the rewind table using hand and eye. Cleaning of dust and dirt should be done during inspection. The inspection process should check for stickiness and other indications of decay, the stability of the splicing, discoloration of black-and-white films, colour balance in colour films, scratches and perforations, shrinkage and growth of fungi (Volkman 1980:42). A record of the inspection results must be maintained and the technical data entered on the relevant database.

Preservationists should also store separately each type of film-based material, isolated from other types of film supports. Other photographic media would thus be protected from the

harmful degradation products of cellulose nitrate. Nitrate films must always be stored away from other materials because of the formation of harmful nitrogen dioxide during decomposition. Safety motion-picture film on cellulose acetate base has been found chemically damaged on occasion by storage in the same can with unstable nitrate film. Investigations on the effects on acetate film of the three nitrogen oxide gases produced by the decomposition of nitrate concluded that nitrous oxide and nitric oxide were harmless, whereas, nitrogen dioxide seriously damaged safety film (Screensound Australian 2001).

Nitrogen dioxide attacks the silver or dye in the film first, the gelatin of the emulsion second, and the acetate base last. Specifically, the nitric acid formed by the degradation of cellulose nitrate can fade silver images, cause gelatine binders to become soft or even tacky, and corrode metal containers and cabinets. Therefore safety films should never be stored in the same can with nitrate films and preferably not in the same room. Deteriorating media should also be segregated from those in good condition as they can induce deterioration in other photographic media. The degradation products of cellulose nitrate poses serious health and safety hazards, so due care and caution must be exercised when handling these types of film.

In addition to providing appropriate storage conditions, preservation activities of audiovisual materials have also focused on converting analogue formats to digital. The underlying influence behind the conversion actions is the realisation that some analogue equipment is already extinct and some carriers are reaching critical levels of degradation, challenging collection managers to transfer information as quickly as possible to an alternative medium.

The transfer of information from analogue formats, such as video, reel-to-reel and cassette tapes, to a digital medium is an ongoing challenge with audiovisual materials. The challenge to preserving digital objects is that their formats are constantly changing and fragile. Due to the limited lifetime of carriers and hardware, the safeguarding of the audiovisual heritage can only be achieved by copying the recorded contents from old to new carriers. Thus, periodic copying, refreshing and migrating the records before the media becomes obsolete or degraded better address their preservation. Migration strategies were dealt with in section 2.6.2 and are not repeated here.

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2.7 PRESERVATION REFORMATTING STRATEGIES⁸

Reformatting and copying original items to produce a version that can be used instead of the originals has been employed for some time in archives as a way of addressing the conflict between preservation and access. Reformatting and copying activities include photocopying, microfilming and digitising (Adcock. n. d). It must be pointed out from the onset that reformatting archival materials raises many intellectual property issues. Luckily for libraries and archives, most copyright laws give librarians and archivists reasonable opportunities to make copies. The principle of “Fair Use” gives libraries and archives the authority to make preservation copies and allow users to make their own copies on their premises. In exchange, the laws call for clear procedures, postings, and rights management policies. Reformatting also affects the artifactual values of materials such as by-products of aging, aesthetics and physical features.

Although reformatting may preserve the content of a document, it does not always save the actual object. This partly explains the wide acceptance of the definition of preservation as prolonging the life of information in documents, rather than the documents themselves (Kenney 1990:184; Ritzenthaler 1993:2). The choice of the reformatting strategies has a profound impact on the way that archival institutions manage and deliver information. The following subsections are going to briefly highlight the relative shortcomings and benefits offered by current reformatting methods.

2.7.1 Photocopying as a preservation strategy

Photocopying is a photographic process of reproducing copies of documents. The major methods of photocopying include silver halide and ozalid (photostating and microfilming); plan (architects’ drawings and engineers’ plans); transfer; and thermographic and electrostatic (xerography) (Mason 1968:25; Ngulube 2002a:121). Xerography is the most widely used method of photocopying (Crystal 1997:1157). In fact, the process is popularly almost synonymous with photocopying. The term photocopying comes from the Greek words for “dry” and “writing” (Crystal 1997:1157). The technique was first demonstrated by Chester. F. Carlson a few decades ago. Although, photocopying applies to photographic reproduction of copies, it has been used in this study in the narrower sense of copies that can be read with the

⁸ The section draws extensively from Ngulube (2002a; 2002d).

naked eye, and produced through the process of xerography. In any case, most photocopiers work on the principle of xerography (Crystal 1997:1157; Ngulube 2002a:121).

Photocopying in most archival institutions in Sub Saharan Africa is primarily done for user convenience (Ngulube 2002a:121). Photocopying is done to get around the task of transcribing archives. Some researchers order photocopies to avoid the expense of travelling and the time involved. It is also done to make some additions to the collections. Although, photocopying is faster and cheaper than microfilming and digitisation, it exposes the paper to agents of deterioration such as heat and light.

The other problem associated with photocopying is that only flat documents can be easily copied. While, paper is cheaper than film, photocopies lack permanence if they are not done on acid free paper using a machine that produces a thermoplastic image by heat and pressure fusing through electrostatic charges (Bellardo & Bellardo 1992:27; Gwinn 1987: 4). In the case of SSA where there are no widely accepted standards for permanent paper, there can be no guarantee of acid free paper being used. Therefore, photocopying is not generally considered as a preservation strategy. It is no wonder that a recent Joint International Federation of Library Associations and Institutions/International Council on Archives (IFLA/ICA) Committee on Preservation in Africa (JICPA) survey established that preservation photocopying programmes were nonexistent in Africa (Coates 2000).

2.7.2 Digitisation as a preservation reformatting strategy

The debate on the use of digitisation technologies is growing in popularity in the archival community because digitisation seems to offer excellent prospects for significant benefits for both archives and archives users; but digitisation also raises considerable preservation problems. The issues associated with the preservation of digital records and archives were discussed in section 2.6 above and they are not going to be repeated here.

Although there are positive benefits to digitisation, particularly in providing remote and enhanced access to information, it is unadvisable to regard it as a panacea for all of the problems of preserving documents (Lehmann 1996:310). Strictly speaking, relying on digital information does not minimize preservation problems; in effect it only increases them. For

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instance, digitisation may actually encourage demand for access to, and display of some originals, and deepen, rather than alleviate, preservation problems (Astle & Muir 2002:67). In fact, Smith (1999a:39) has argued that digitisation has made a challenging preservation problem only worse.

Digitisation is tremendously expensive (Conway 2000; L'Homme 1999; Saffady 1999:317). Be that as it may, many professional conferences on digitisation and publications dealing with the subject rarely examine cost implications and the issue of affordability (Saffady 1999:318). For all practical purposes, digitisation is costly to implement. The costs are in the form of hardware and software, user training requirements, manpower to sustain the system, converting archival materials to machine-readable form and maintenance. At times, huge digital files can also be expensive to store and difficult to transfer. Many digital technology enthusiasts often ignore these cost implications.

Furthermore, the world of electronic information is still at a nascent stage in terms of preserving digital information (Task Force 1996). The statement still rings true in the context of the developing world where digitisation is done in piece-meal fashion. Unlike, the case with microfilm, procedures and standards for digitisation are still evolving. In fact, sustainable solutions to digital preservation problems are not yet available (Kuny 1997). In that regard, digitisation should be considered as one of the tools that constitute the preservation toolkit, rather than a complete answer to long-term access to archival documents. In fact, a recent report on the intrinsic value of documents explicitly rejected the use of digital imaging for preservation purposes because of loss of evidential value and permanent accessibility inherent in digital forms (Menne-Haritz & Brubach 1999).

Presently, most preservationists hold the view expressed at the 1995 Libraries Research Group (RLG) Digital Selection Symposium, that "digitisation appears to have a preservation role in reducing use of originals ... but appears not to be suitable for preservation of information that is preserved in no other form" (Ogden 1996a:116). In fact, the consensus among most American preservation officers is that digitisation alone does not constitute preservation (Gertz 1998).

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The use of microfilm for preservation and digital imaging for improving access, or the hybrid approach advocated by Chapman, Conway and Kenney (1999) has been acknowledged by Menne-Haritz and Brubach (1999) as the only feasible way of benefiting from the relative advantages offered by both technologies. The hybrid approach will make it possible for those readers who find microfilms awkward and unpleasant to work with to have access to digital information.

Accordingly, digitisation should be employed to provide the benefits such as remote and multiple access, speed of retrieval, searchability, and high storage densities compared with paper and film. On the other hand, microfilming would take care of the preservation side of things. Essentially, digital conversion should be confined to materials that are in demand, regardless of their condition.

Under the present circumstances where standards for digital preservation are not yet established the basic purpose of digitisation should be confined to creating reproductions that can be viewed by as many people as possible, and as easily as possible. In that regard, preservation microfilming and digital conversion can overlap to provide access as well as rescue materials that are both endangered and in demand.

Before concluding this subsection it is noteworthy that the hybrid approach that marries microfilm for preservation and digital imaging for access is still an expensive option. Rather, archival institutions should continue to use microfilm for preservation reformatting and only turn to digitisation as a means of enhancing access. In any case, conversion from microfilm to digital formats is possible though very expensive (Chapman, Conway & Kenney 1999).

2.7.3 Microfilming and the preservation of records and archives

Microfilm is a micrographic format in the same classification as aperture cards, computer output microforms (COM), microfiche jackets, sheet film and micro-opaques (Körmedy 1989:27). The word “micrographics” should not sound unfamiliar to most archivists and the science of microfilm is certainly not new. Micrographics, a specialised information management technology involved in the creation and use of microfilm images has been around for more than 150 years (Kuan Wah 1999:184). Micrographic formats are collectively referred

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to as microforms. Microfilming is the most popular microform used in Africa and other archival institutions. Microfilm has developed to become the most effective and reliable tool for preservation reformatting since 1839 when John Benjamin Dancer, the British optical craftsman, invented the technique for microreproduction (Kuan Wah 1999:194; Stockford 1996:31).

Microfilming is a photographic process of producing reduced images on a roll film, which usually require optical assistance to be read, of the intellectual content of documentary materials, following the standards and specifications necessary to provide optimal bibliographic and technical quality (Acland 1993:474; Gwinn 1987:2). Thus, the information on a microfilm can be viewed or printed out in hard paper copy. Evolving information and communication technologies (ICTs) can digitise microfilm images for use in the computer environment.

Despite predictions that microfilm could be replaced by digital imaging, users of this technology have come to appreciate that simply digitising material does not guarantee its continued preservation (Dalton 1999; Smith 1990). Until digital preservation capabilities can be broadly implemented and shown to be cost-effective, microfilm will remain the primary reformatting strategy for deteriorating paper-based records. Microfilm offers acceptable levels of quality, media longevity, and little machine dependency.

The master negative silver halide microfilm, if properly created and stored according to international standards, boasts a life expectancy of about 500 years (Dalton 1999). The microfilm industry is very mature with a well-established technology and defined standards developed with the cooperation of users and manufacturers, scientists and researchers (Kuny 1997; Saffady 2000). The creation of preservation microfilm since the early 1980s has been governed by a well-defined set of international standards that specify the preparation of documents, bibliographic control, the physical composition of the film media, processing techniques, the visual quality of three generations of film, and storage requirements. In other words, metadata standards on microfilming are clearly defined and more widely accepted than those in the electronic environment.

Microfilming, while not the most perfect, has proven to be an effective technology for preserving archival materials vulnerable to damage and loss through handling and poor environmental conditions as well as facilitating shared access to endangered research materials. It can also enable readers in distant locations to gain access to the content of archival materials without actually visiting the archives repositories. It is also worth noting that, while digital data requires use of a sophisticated retrieval system to access its treasures, microfilm can be read by the naked eye using only light and magnification. Contrary to Foot's (1994:321) view microforms are relatively inexpensive to produce and to copy. They are capable of capturing all types of images and can be successfully applied to all documentary materials (Dalton 1999; Saffady 2000).

One key indicator of the continuing relevance of microfilming as a reformatting and preservation strategy is its ongoing support at the international level. For instance, recently the International Meeting on Microform Preservation and Conservation Practices in Southeast Asia on assessing current preservation needs and evaluating past projects, reaffirmed that microform remains the primary reformatting medium for long-term preservation of the contents of library and archival materials, providing that international standards for production and storage are adhered to (Brown 2000). The experts at that meeting also endorsed the fact that emerging new technologies such as digitisation may be useful adjuncts for access and image-capturing, but must not be seen as substitutes for preservation on microfilm.

It is worth noting that while digital imaging can be used in the United States to enhance access, preservation goals will not be considered met until a microfilm copy or computer output microfilm recording of digital image files has been produced that satisfies national standards for quality and permanence (ANSI/AIIM MS23-1998). In a recent study the European Commission on Preservation and Access concluded that microfilm should be used as a basis for preservation programmes (European Commission on Preservation and Access 1997).

The strengths of microfilm are clear: saving space, maintaining file integrity, providing security copies of vital records, easing duplication and distribution, easing integration with computer systems (COM), and preserving information (Lowell 1985:22). Additionally, there

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are internationally accepted standards for microfilm. Film also has a proven lifespan of 500 years and can be read in an emergency with nothing more sophisticated than a lens or a hand held viewer. In that regard, preservation microfilming has quietly maintained its status as a highly valued and widely practiced preservation reformatting strategy amidst the bells and whistles of the digital revolution (Ogden 1999).

To a large extent, microfilming has proven to be an effective technology for rescuing brittle paper and for facilitating shared access to endangered research materials. Until feasible solutions to preserving long-term access to digital documents are developed, microfilming will remain the most appropriate preservation strategy for archivists, especially, in the developing countries where expensive digitisation projects are impeded by scarce resources and scant research in digital preservation. Presently, digital conversion seems to be only attractive in terms of enhancing access to documents.

Hazen, Horrell and Merrill-Oldham (1998:14), and Menne-Haritz and Brubach (1999) acknowledged that the use of microfilm for preservation and digital imaging for improving access, or what Chapman, Conway and Kenney (1999) called the hybrid approach, is the only way of benefiting from the relative advantages offered by both technologies. For that reason, microforms and digital objects are used hand in hand in the UK to enhance access to archival materials as well as ensuring their continued survival (Feather & Eden 1997:17; Shenton 2000).

Although reformatting can facilitate long-term access to documentary materials, preventive care for records and archives encompassing proper storage, handling, and security are some of the strategies that can tremendously reduce the need to reformat them.

2.8 HANDLING AND CARE

It has been argued that humankind is “unquestionably the greatest enemies of the materials on which they record their thoughts” (Cunha & Cunha in Westbrook 1985:4). Humankind is the root cause of the conditions that promote or retard the deterioration of documentary materials (The Library Association 1972:9-10). Humankind has little control on the nature of materials on which records and archives are created, but much can be done to control the deterioration

of materials. Most environmental factors, which initiate the degradation mechanisms of documents, can be managed. The environment in storage areas is crucial to the preservation of records and archives.

Environmental factors such as biological agents, temperature, relative humidity (RH), air pollution, dirt, and light can contribute to the deterioration of documentary materials (Cunha & Cunha 1983:10; 62-63; Hodson 1972:91-106; Jones & Ritzenthaler 1988:188; Kufa 1997:159; Ritzenthaler 1993:45; Swartzburg 1995:77; UNESCO 2000). The control of environmental factors has a positive impact on controlling biological factors such as mould, silverfish and other biological enemies of records and archives. The factors that can accelerate the deterioration of records and archival materials are discussed in more detail in the subsequent subsections.

2.8.1 Temperature and relative humidity

The maintenance of proper temperature and relative humidity (RH) in records storage areas is very important. According to Ogden (1996b) control of temperature and relative humidity is of critical importance in the preservation of documentary materials because they contribute significantly to the deterioration of materials. Although, there are no agreed standards for temperature and RH in storage and use areas, there is consensus within the preservation community that lower temperatures and a lower relative humidity greatly extend the life expectancy of documentary materials (Adcock. n. d; Patkus 1998:73). The wrong environment can doom archival collections to a very short life span. Therefore, control of temperature and RH levels should be the cornerstone of any responsible preservation programme (Shahani, Hengemihle & Weberg 1995:61; Williams 2000:32).

The combination of high temperature and high humidity hastens the chemical deterioration of materials. These factors also play a major role in the multiplication of some of the biological agents discussed in section 2.8.4 below. Relative humidity represents “the amount of moisture in the air relative to the amount the air is capable of holding, expressed as a percentage” (Appelbaum 1991:25). On the other hand, temperature, which is the degree of hotness or coldness of an object, is expressed in degrees Celsius (°C) or Fahrenheit (°F). It is important to realize that temperature and RH are interrelated; a change in one will bring about a change in

the other. The rate of most chemical reactions is approximately doubled with each increase in temperature of 18°F (10°C) (Adcock. n. d; Shahani, Hengemihle & Weberg 1995:61). High relative humidity provides the moisture necessary to promote harmful chemical reactions in materials and, in combination with high temperature, encourages mould growth and insect activity. Extremely low relative humidity may lead to desiccation and embrittlement of certain materials.

It has been argued that the level of RH and temperature that is ideal for preserving materials varies from format to format (Ritzenthaler 1993:46). However, studies have shown that most paper-based materials stored at 22° C and 50% RH would have an approximate lifetime of 33 years, but if the temperature were lowered to 16° C and the humidity to 40%, such materials would have a lifetime of 88 years (Reilly, Nishimura & Zinn 1995:7). Similarly, if materials were to be subjected to high temperatures and humidities (such as 28° C and 75% RH) noticeable deterioration would occur in nine years or less. Furthermore, Reilly and Nishimura and Zinn (1995:7) demonstrated that if temperature and RH were kept at either 14°C and 50% RH or 16° C and 35% RH the materials would have a lifetime of close to 100 years.

Maintaining stable conditions is of great importance (Trinkaus-Randall 1998:105; Ritzenthaler 1993:51). In essence, temperature and relative humidity should not be allowed to fluctuate. Research done at the Library of Congress has shown that chemical deterioration of paper proceeds more quickly if paper is exposed to temperature fluctuations than if it is stored at a constant temperature (Reilly, Nishimura & Zinn 1995: 20). Though authorities like Erhardt and others (1995), Lull (1995), McCrady (1994), Peters (2000:5) and Real (1995) disagree on the ideal temperature and relative humidity for records and archival materials a frequent recommendation is a stable temperature no higher than 70°Fahrenheit or 21°Celsius and a stable relative humidity between a minimum of 30% and a maximum of 50%.⁹

The ultimate consideration should be informed by the need to maintain a “thermodynamic equilibrium by optimally preparing or conditioning the air” in which documents are stored and

⁹ Erhardt and others, and McCrady’s articles provide an overview of the Smithsonian Conservation Analytical Laboratory research on climate control, while the others question recommendations made by a Smithsonian press release describing the research. For further discussion of the controversy, see WAAC Newsletter (September 1996).

in which they are consulted (Stehkamper 1988:164). However, controlling climate conditions, such as temperature and relative humidity, is a much more difficult task. Installing heating, ventilation, and air conditioning (HVAC) systems and monitoring the weather can aid in controlling the climate.

Installation of adequate climate controls and operation of them to maintain preservation standards will retard the deterioration of materials considerably. Climate control equipment ranges in complexity from a simple room air conditioner, humidifier, and/or dehumidifier to a central, building-wide system that filters, cools, heats, humidifies, and dehumidifies the air (Patkus 1999a).

However, climate control equipment tends to break down and the energy resources to keep an air-conditioning system running are prohibitive for most countries in sub Saharan Africa. Instead, some authorities such as Briggs (1994), Giovannini (2000), Gut and Ackerknecht (1993), Harris (1993) and Rowoldt (1993; 1998) advocate the design of climate responsive buildings. The buildings would have 'natural' methods of air-conditioning in order to reduce the installation, energy and maintenance costs. Therefore, the suggested model advocates buildings that should be structurally designed in such a way that their makeup would control heat and solar radiation, and regulate air circulation without the use of artificial means such as air-conditioning.

In other words, archival buildings should exploit structural rather than artificial means to control the environment. Air-conditioning cannot be relied upon as it can breakdown and electricity supplies to power the equipment might not be always available. In fact, a survey carried out by Mazikana (1997) showed that air conditioning systems at most archival institutions in Africa had broken down and had gone unattended to due to shortage of foreign currency to procure spares. In another survey carried out in Africa, Coates (2000) discovered that only 15% of the purpose-built buildings had air-conditioning. Air-conditioning might be the answer to controlling the climatic conditions that affect records and archives, but it expensive to install and maintain.

According to Hadgraft (1994:47) and Briggs (1994:49) all air-conditioning systems have an in-built obsolescence with a life of about ten to twelve years. Many archival institutions in the developing world can least afford maintenance and replacement costs, given their meagre resources and foreign currency constraints. A few years back, the National Archives of Zimbabwe and the National Film and Sound Archive of South Africa went without an operable air-conditioning system for about five years due to poor maintenance and lack of spare parts.

While the natural means of preservation as opposed to artificial means seem to hold the most promise for the preservation of the archival heritage the problem is that most buildings where records and archives are presently housed were designed without taking climatic controls into considerations. For now, we will have to live with the problem of controlling temperature and relative humidity because any attempts to redesign them would be very prohibitive in terms of costs. The issue of the design of archival buildings is further dealt with in sections 2.8.5.1 below and 3.3.3 in Chapter Three.

Additional measures that can be taken to control temperature and relative humidity include adequate maintenance on buildings. Keeping doors and windows closed to prevent exchange of unconditioned outside air. Removing of holdings from attics, which tend to be hot, and basements, which can be damp, can lessen the deterioration of materials due to climatic conditions. Archives and records may also be protected from moderate fluctuations by acid free archival boxes.

Monitoring of temperature and RH is essential to the success of climate control. Frequent checking of temperature and RH is very important in equatorial, sub-equatorial, tropical and monsoon climates because the warm and damp conditions present special problems for the preservation of documents (Duchain 1977:134). Many of the problems associated with protecting records and archives against temperature, RH and biological factors apply acutely to these climates. Monitoring can be achieved through the use of measuring instruments and records and archives personnel. Monitoring can either provide data to show that current climate control is inadequate or guard against any environmental extremes that might occur.

Some of the instruments used for monitoring temperature and RH are summarized in Table Two.

Table 2: Instruments for measuring relative humidity (RH) and temperature¹⁰

Instruments	Temperature	RH	Remarks
Thermometers	Yes	No	Provide accurate temperature
Hygrometers	No	Yes	Not recommended because they can be very inaccurate and most cannot be recalibrated
Humidity indicator strips	No	Yes	Provide only approximate readings
Psychrometers	Yes	Yes	Accuracy depends on the design of the calibration instrument and the skill of the user
Hygrothermographs	Yes	Yes	Standard choice for monitoring temperature and RH
Dataloggers	Yes	Yes	Data is transferred between the datalogger and a personal computer that does data analysis

All the measuring instruments enumerated in Table Two excepting hygrothermographs and dataloggers cost very little. Thermometers, hygrometers and psychrometers provide a snapshot of current conditions rather than an ongoing record (Patkus 1998:73). Notwithstanding cost considerations institutions can choose between hygrothermographs and dataloggers since they are reliable instruments of measurement (Patkus 1999a). Although dataloggers have an advantage over hygrothermographs in terms of having the ability to electronically analyse data, hygrothermographs are more recommended (Patkus 1999a).

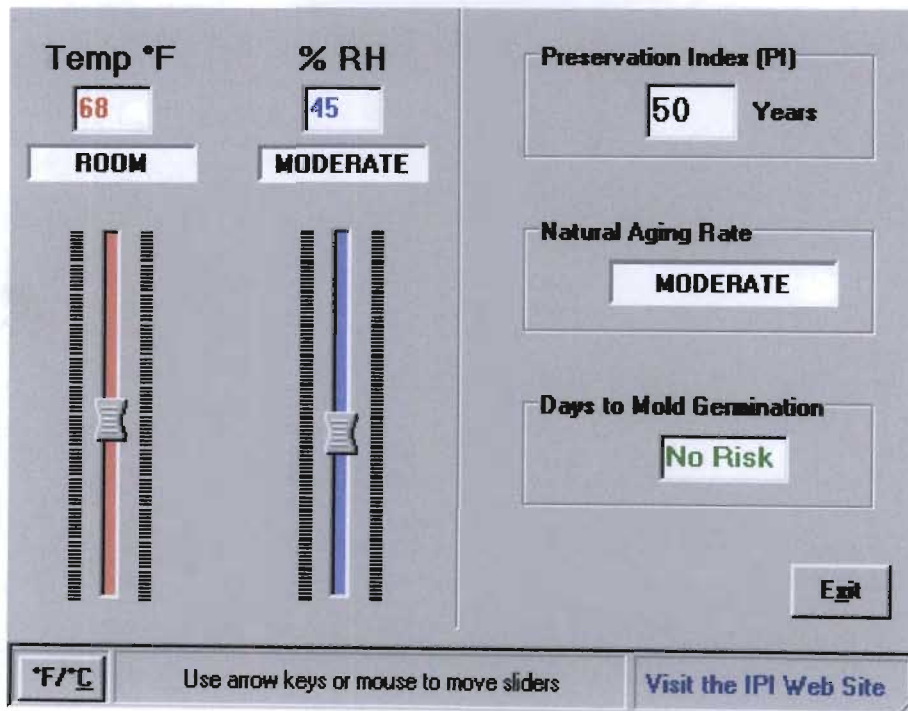
A datalogger does not provide continuous monitoring in the way that a recording hygrothermograph does. Most loggers can take measurements at intervals ranging from a few seconds to a few hours as more frequent measurements will occupy more memory and require more frequent downloading of data. In addition, some loggers use sensors that have a “time-lag” of four or five minutes. If the humidity were falling, this would be a disadvantage if very frequent sampling were required.

¹⁰ Tables that are not attributed to any particular sources were constructed by the author of the thesis from data gathered from a variety of information sources and the information was not originally in table format.

Monitoring environmental conditions largely depends on people rather than automatic recording instruments. Therefore an effective monitoring programme will depend on a written plan for collecting information and maintaining instruments by people assigned the monitoring responsibility in the institution. The plan should identify areas to be monitored, the procedures to be adopted, and forms for recording needed information (Patkus 1998:74).

The recently developed Preservation Calculator, a tool for managing the environment developed by the Image Institute in Rochester, New York is going to ease problems of monitoring the climate (Image Permanence Institute 2002; The National Archives of the Netherlands *et al.* 2001:97). Interpreting temperature and RH data from a large table of RH and temperature data, or from a series of hygrothermograph charts is extremely difficult (Reilly, Nishimura & Zinn 1995:4). However, the Preservation Calculator makes it possible to quantify the result of changes in climate control equipment, that is, modifications of the HVAC systems, the addition of room air conditioners or dehumidifiers, and changes in air circulation. The Preservation Calculator is illustrated in Figure Two below.

Figure 2: Sample Preservation Calculator



As exemplified in Figure Two, the Preservation Calculator features two sliders by which temperature and RH values can be raised or lowered using either the mouse or arrow keys on

the computer keyboard. Numerical temperature and RH values are displayed (in either °F or °C) in boxes above the sliders. The maximum temperature and maximum RH on the Preservation Calculator are 65°C and 95% respectively. On the other hand, the minimum temperature and RH are – 23°C and 0% respectively. Below these are displayed descriptive words that characterize the ranges of temperature (hot, warm, room, cool, cold) and RH (damp, high, moderate, dry, very dry). The impact of the displayed conditions on collection materials is displayed in three other boxes labelled Preservation Index (PI), natural aging rate, and days to mould germination.

According to the Image Permanence Institute (2002), the Preservation Calculator is an easy-to-use freeware program designed for use as a planning and analysis tool for collection storage environments in libraries, archives, and museums. The Preservation Calculator shows how temperature and humidity combine to influence their rate of decay. It also gives the estimated time it will take for spores of xerophilic mould species to germinate at a particular environmental condition.

The Preservation Index (PI) measures the effect of storage conditions on the rate of natural aging of holdings. The higher the PI, the better conditions are for preservation of organic materials. If conditions change over time, the life expectancy of an object also changes. PI is not meant as a predictor of the useful life of any particular object. It is simply a convenient measure of the effect of environmental conditions on the overall life expectancy of collections. Chemical decay is the gravest threat to records and archives, and therefore PI is a good indication of the overall preservation quality of the storage environment (Reilly, Nishimura & Zinn 1995:6).

In short, the Preservation Calculator illustrated in Figure Two can be used to:

- determine how temperature and RH are affecting organic objects in storage;
- obtain an on-the-spot evaluation of any given storage condition;
- compare the advantages (or disadvantages) of different storage conditions; and
- facilitate the planning of new storage environments.

2.8.2 Light

According to Hunter (1997:144), “When God said, ‘Let there be light,’ a footnote might have been added: except in archives”. All wavelengths of light, that is, visible, infrared, and ultraviolet (UV) promote the chemical decomposition of organic materials through oxidation. Light can cause some papers to bleach and others to yellow or darken; it can also cause media and dyes to fade or change colour, altering the legibility and appearance of documents (Adcock. n. d). Adcock (n. d) argued that light damage is irreversible. Therefore, light levels must be kept as low as practically possible in storage, reading, and display areas.

Sources of light are sunlight and incandescent and fluorescent lamps, the two primary artificial light sources currently in use in most records offices and archives. Exposure to natural light is undesirable because of its intensity and high ultraviolet (UV) content. UV radiation is the most energetic and destructive form of light (Patkus 1999b). They cause photochemical deterioration to happen more quickly, and they are extremely damaging. One of the primary photochemical reactions is oxidation, in which molecules transfer their energy to an oxygen molecule leading to damaging chemical reactions.

Light is measured with a light meter. Lacking this, the built-in meter of a single-lens reflex camera can be used (Ogden 1996b). UV meters or lux meters measure the proportion of UV in visible light, expressing it in microwatts per lumen. Collections should never be exposed to UV in amounts exceeding 75 microwatts per lumen. Any light source with a higher UV emission must be filtered.

Since damage is a function of both intensity and duration of exposure, light level should be kept as low as possible, and exposure should be for the shortest time that is feasible. Ideally materials should be exposed to light only while in use (Ogden 1996b; Patkus 1999b). When not in use, they should be stored in a light-tight container or in a windowless room illuminated only when materials are being retrieved. Illumination should be by incandescent bulbs.

2.8.3 Particulate control and gaseous contamination

Pollutants contribute heavily to the deterioration of archival materials (Guttman & Kenneth 1993). However, the research into pollution levels that can cause serious damage to archival

materials is beyond the scope of the present study. The pollutants that cause damage to records and archives, and measures to control air quality are discussed in this section.

The two major types of pollutants are gases and particulates. Gaseous contaminants, especially, sulphur dioxide, nitrogen oxides, hydrogen peroxide, hydrogen sulphide and ozone cause harmful chemical reactions that lead to the formation of acid in materials (Joshi 1995:71). For instance, sulphur dioxide which is emitted in the atmosphere due to combustion of coal, residual oil, smelting ores and refining of petroleum reacts with oxygen and water vapour to produce sulphur trioxide. In turn sulphur trioxide is converted to sulphuric acid. Sulphuric acid is very corrosive. Equally destructive is nitric acid, which is formed by the combination of nitrogen oxide and water vapour. Gaseous pollutants are a very serious problem for paper and leather, which are particularly vulnerable to damage caused by acid. Paper becomes discoloured and brittle, and leather becomes weak and powdery.

On the other side of the coin are total suspended particulates (TSP) such as dust, soot and smoke that damage materials. The particulates contain carbon, ash, oil, grease, asbestos and many other substances (Joshi 1995:72). A chain reaction caused by the substances transfer acidic constituents to paper.

Admittedly, controlling air quality is difficult and complex, but it is recommended that the amount of pollutants in the air be reduced as much as practicable. Some of the measures to control air quality include:

- the provision of good air exchange in areas where collections are stored or used, with replacement air being as clean as possible;
- insuring that air intake vents are not located near sources of heavy pollution;
- keeping exterior windows closed;
- storage of records and archival materials in archival-quality enclosures; and
- controlling pollutants from cigarettes, paints, sealants, wooden storage/display materials and cleaning compounds.

2.8.4 Biological factors

Biological factors such as rodents, insects, and mould can be added to the list that contribute to environmental problems. The problems stem from the fact that archival documents are made of organic materials. According to Wood Lee (1988) organic materials are susceptible to biological attacks. Biological factors have played a great role in the deterioration of records and archives in Africa. Gibbs (1985:152) once observed:

...the battle to prove that Africa has a history has been won, but the war to discover and write up that history has been lost. The archives in which transcripts of oral history, files, documents, tapes, photographs and films are being stored are, by no stretch of imagination, time and germproof. Paper on which history is written and from which history is rewritten is self-destructive. Paper's decay is assisted by insects which have in many archives transformed documents into doilies.

More specifically, insect infestations were reported to be causing havoc in Botswana (Kufa 1997:159). Insects have not spared the historical manuscripts of the sixteenth century in Timbuktu (Mali) (Dominy 2003:5). In fact, a Timbuktu Manuscripts Project to restore the damaged manuscripts was launched on May 25, 2003 by President Thabo Mbeki of South Africa and President Alpha Konare of Mali as part of the celebrations of the 40th anniversary of the Organisation of African Unity in Johannesburg (Dominy 2003:5). The Project will improve the storage conditions in which the manuscripts are kept as well as help the Malians to conserve the manuscripts.

The most common insects that attack records and archives are: silverfish, beetle, cockroach, psocids or booklice, moths and termites (Brandt 1995:55). Mice and rats are the most common rodents, while penicilliums and aspergillus are the most common species of moulds that are inimical to documentary materials. These biological factors are discussed in the following sections.

2.8.4.1 Silverfish

The term silverfish is used for the Thysanura and for any of the species within the order. There are many species of Thysanura. Some of them are the firebrat (*Thermobia domestica*), the silverfish (*Lepisma sacchrina* L), the four-lined silverfish (*Ctenolepisma quadriseriata*) and

the gray silverfish or giant silverfish (*C. longicaudata*) (National Park 1980). What they have in common is the distinct carrot shaped body, short legs, long slender antennae and three tail-like appendages (anal cerci) at the end of the body. They are also wingless with scale-covered bodies, which are about half an inch long.

Silverfish is found indoors in warm, humid areas such as basements. Silverfish thrive best at a temperature of between 22 °C and 27°C and at a relative humidity of 75% to 97% (Parker 1988). If we were to go by the temperature ranges in some selected towns in South Africa at Table Three in Chapter Three it is evident that most collections are susceptible to silverfish invasions.

Feeding habits of silverfish species are very similar (National Park 1980). Once a source of food is located, silverfish remains in the vicinity. Silverfish feeds on human foods, especially those containing starch or flour, as well as on paper, especially glaze-coated paper. They eat sizing on paper, as well as glue and paste. They may feed on wallpaper or the paste behind it, causing the wallpaper to become detached from the wall.

Detecting damage caused by silverfish is the best way of monitoring its presence. The sizing of paper will be removed in irregular fashion, and the edges of paper will appear notched. In cases of high populations irregular holes will be eaten directly through paper. Other signs of feeding include faeces, scales, and small yellow stains. In addition, the presence of silverfish can be observed by coating a piece of paper with a thin layer of flour paste and placing it in an area suspected of harbouring silverfish. If silverfish are present, the paper will show small feeding marks.

Silverfish can live for nearly a year without feeding. Temperature is the most important factor influencing the Thysanurans (National Park 1980). Low temperatures result in high mortalities, especially among nymphs. Low relative humidities may reduce population growth. Warm temperatures and high relative humidities favour most silverfish species. Controlling or eliminating moisture in areas infested with silverfish can reduce populations. Lower temperatures may also slow population growth by reducing rates of development and reproduction in silverfish. Sealing cracks and crevices where silverfish hide and breed also

reduces populations by reducing suitable habitat. Good sanitation practices are key to reducing silverfish infestations. In non-chemical means are ineffective boric acid could be spread thinly in areas where silverfish are active.

2.8.4.2 Moulds

According to Florian (2002:7-11) and McCrady (1999) fungus is the umbrella term for mould, mildew, mushrooms, yeasts, and puffballs. Mildew is a popular term for visible mould in the home. The term mould refers to the microscopic fungus, which put out root-like rhizomes, releasing spores, and living in colonies. At times mould is used interchangeably with the word mildew. These micro-organisms damage the materials supporting them. The scattered spots known as foxing on paper prints or drawings is damage resulting from moulds.

The organic materials on which records and archives are created as well as dust and dirt provide nutrients required by the mould. Most materials used for creating documents are hygroscopic, that is, they attract and hold moisture. According to Wood Lee (1988), the five critical environmental factors that promote the growth and development of mould in collections are: the presence of mould spores, a source of nutrients, adequate moisture, suitable temperature for a particular variety of mould and limited air circulation.

Requirements for air and light vary. Most microbial forms grow in temperatures ranging from 59°F to 95° F (15°C to 35° C), although there are forms, which will grow at almost freezing point and others, which thrive at over 150° F (65° C). The average optimum for mould growth is usually stated to be in the vicinity of 86° F (30° C) (Wood Lee 1988; McCrady 1999). The optimum temperature for the growth of specific moulds is difficult to determine, in part because most of the information available on the growth and development of mould is derived from laboratory cultures rather than on site studies (Gilberg 1994; Wood Lee 1988). In addition, scientific information about mould growth and development is incomplete (Gilberg 1994).

The problem of controlling mould outbreaks in archival repositories is further complicated by the fact the metabolism of fungus is much like our own. What is deadly to mould can also be dangerous to human beings, for example, ethylene oxide effectively kills mould but is not safe

for humans. However, according to Kaplan (2001) a controlled environment with good air circulation, moderate temperature of say 68° to 72° F (20° C to 22° C) and a relative humidity of less than 60% (ideally 35-40%) will dramatically aid in preventing large-scale outbreaks of mould. In 1994 it was also suggested by Florian (1994) that mould will not grow below 70% RH. Cunha (1988) is of the view the most effective treatment for mould is the modification of the environment and removal of the mould growth from the affected item.

2.8.4.3 Other biological enemies of records and archives

Although there are many biological enemies of records and archives, this section examines some of them, which include beetles, booklice, cockroaches, mice and rats, and termites. Beetles require an environment with high relative humidity. Beetles feed on drugs, leather, spices, dried vegetable matter, herbarium collections, corn husk dolls, chocolate, breakfast foods, books, and rare manuscripts (Parker 1988).

Booklice are found all over the world and they cause negligible damage to archival materials. They are very tiny insects measuring 1 to 2 millimetres long. Most booklice infesting books and paper products have no wings (Parker 1988). Generally, they do not feed on documentary materials. Rather, they feed on microscopic moulds that grow on paper products when they are stored in damp conditions. On the other hand, cockroaches develop and live in a climate with a wide range of temperatures. Faecal material of cockroaches, streaking, and chewing can cause considerable damage to documentary materials.

The house mouse is the most common rodent found in archives and records repositories. Mice seem to be able to invade practically any structure humankind has made. Rats may also invade holdings seeking out food and shelter. Damage to documentary materials comes from mice and rats destroying materials for nesting purposes and urinating and defecating on the materials. Mice and rats leave faecal droppings wherever they have been active. Other signs of infestations are gnaw marks; small, stained holes in floors and walls; and a pungent odour from their urine (Parker 1988). Mice and rats can also gnaw the insulation of electrical wiring exposing archival holdings to electrical fire hazards that are discussed in section 2.9.1 below.

Many kinds of termites can be found throughout the world. They include drywood, dampwood, furniture, subterranean, Formosan and desert termites (Parker 1988). Cellulosic materials make up the majority of a termite's diet. Since records and archives are largely composed of cellulose, they make up a banquet for termites. Termites could attack the structure of the building as well as consuming all paper products. They can be particularly destructive in storage areas where inspections of the holdings are not done regularly.

2.8.4.4 Pest management in records and archives

Preservation professionals have tried a variety of strategies to eliminate biological agents such as rodents, termites, silverfish, cockroaches, booklice and beetles. A lot of resources have been spent on over-the-counter products, professional services and restricted use pesticides. And yet we still have pests. In fact, some experts suggest that we are doing little other than creating super-pests, with increasing resistance to more and more pesticides (Chicora Foundation 1994; Child 1999b). As a result of these factors and the harmful effects of some chemicals in pesticides, experts are increasingly recommending the 'least chemical approach' such as the integrated pest management (IPM) strategy (Alpert 1994; Chicora Foundation 1994; Gilberg 1994; Parker 1988; Swartzburg 1995). It has been realized that some chemical treatments are carcinogenic, that is, suitable for eliminating biological factors, but very harmful to human beings and documentary materials. Documents are stained and damaged as result of contact with pesticides.

Although, many archival institutions have a contract for periodic spraying, they do not have answers to these questions: What is being sprayed? Why it is being sprayed? What evidence is there of pests in spite of the treatments? What written statement of the findings and work is submitted after each visit? (Chicora Foundation 1994). Unfortunately, archivists tend to rely entirely on the commercial company's good will and expertise. And yet the answers to these questions are critical to the effective management of pests in archival holdings.

For instance, a study conducted by Beckwith, Swanson and Iliams on biocides used as paper protectants found out that 28 commonly recommended fungicides were either ineffective in killing mould or damaging to paper (cited in Cunha 1988). The use of thymol and orthophenyl phenol crystals dissolved in alcohol as fungicides for mould has been radically curtailed by

recent studies showing that both can damage the eyes and upper respiratory system (Rhys-Lewis 1996:16). Thymol is believed to be the more toxic of the two, affecting the liver, kidneys, central nervous system and the circulatory system as well (Barton & Wellheiser 1985:63).

Fumigation may also be hazardous to human beings. The term fumigation is used in this study to include any treatment, which relies on exposure to the fumes, or vapour of a biocidal compound to kill biological organisms such mould, silverfish, beetles, cockroaches and others. Ethylene oxide (ETO), which was developed in 1859, has been the commonly used fumigant in museums, libraries and archives since the 1950s. Ballard and Baer (1986) provide an excellent study of the history, use, effectiveness, and hazards of ethylene oxide. The two conclusively demonstrated that ethylene oxide (ETO) is only suitable for fumigating materials in a vacuum chamber equipped for the use of ETO.

Ethylene oxide (ETO), vikane and methyl bromide are gaseous fumigants that are highly toxic to human beings (McComb 1980). Ethylene dibromide and ethylene dichloride (in the form of Dowfume 75) are now considered safe for use only in public buildings with very special precautions and mechanical installation (Haines & Stuart 1986). In fact, many archival institutions including the Maine State Archives in the USA ceased the use of most of these fumigants in the early 1980s (Osier 1994).

It is surprising that some consultants still recommended methyl bromide for fumigating termites at the National Archives of Zimbabwe (Hendriks and Kathpalia 1987:3). They did not state the dangers associated with the fumigant, especially when the appropriate fumigation chamber is not used. In addition, documentary materials tend to retain the pesticides that they are exposed to during treatment for a considerable length of time. The chemical residue might have side effects on humans. Perhaps, the lack of conscientiousness by some consultants prompted Rhys-Lewis (1999:166) to counsel against the uncoordinated funding of preservation projects as well as using dubious consultants. Thus, he concluded:

There needs to be a greater control of aid funding. International projects must become better co-ordinated and ideally matched to individuals with the correct expertise (Rhys-Lewis 1999:166).

As a result of hazards posed by chemicals to both humans and documents, IPM has been recognized as the most effective pest management programme (Chicora Foundation 1994; Swartzburg 1995:61). The IPM approach relies primarily on non-chemical means, such as controlling climate, food sources, and building entry points, to prevent and manage pest infestation. Chemical treatments are used only in a crisis situation threatening rapid losses or when pests fail to succumb to more conservative methods (Patkus 1999c). The use of deep-freezing conditions and anoxic (oxygen starving) treatments have proved very effective to museum collections and archivists are increasingly adopting these non-chemical means to deal with infestations in archives and records centres.

According to Gilberg (1994) the non-chemical strategies available for pest control include low/high temperatures, modified atmospheres achieved through the use of nitrogen, argon and carbon dioxide, and radiation. He described most of these processes and gave some parameters for application like temperature, RH, time and energy of radiation. All these strategies can be effective if used correctly. For instance, freezing was successfully used at the Municipal Archives in Windsor, Ontario (Walsh 1997). The process involves getting the temperature down to zero degrees within 24 hours, freezing for a period of 48 additional hours and then bringing it back to room and or repository temperature within 24 hours. The Library of Virginia's new State Records Centre is another example of a repository that uses the "least chemical methods" (Huff 2001). They have a Pest Eradication Chamber to treat incoming archival records that happen to be infested with insects. The chamber is actually a specialized blast freezer that operates on the same principle of freezing as described for the Municipal Archives in Windsor above.

Understanding insect life cycles and habits are important in IPM. It usually forestalls the symptomatic treatment of infestation. In order to implement a building-wide or institution-wide pest management programme it is essential to be aware of the four categories of pests discussed by Alpert (1994). The four categories of pests are:

- those that specifically attack objects (e.g. powder post beetles, odd beetles, *tineola*;
- general building infestations (e.g. silverfish, dermestids, psocids, mites);
- those that attack structures (e.g. carpenter ants, anobeids, termites, carpenter ants, yellow jackets); and

- occasional invaders (e.g. spiders, flies).

Armed with these categories it is possible to implement the following basic components of an IPM programme in an archival environment (Adcock. n. d; Chicora Foundation 1994; Child 1999b; Swartzburg 1995:61):

- Regular monitoring of pest activity and the environment.
- Checking all material which is to be accessioned before it enters the archives.
- Use of sticky traps: traps have the advantage of catching insects before they can be found visually; they catch a wide range of species; they can be placed in areas which are difficult to inspect; trapped insects can be identified and counted; traps are also good indicators of an increase in insect numbers in one area as well as highlighting any failure of control treatment.
- Eliminating potential sources of infestation, for instance food and drink should not be consumed on the premises; and flowers and plants should not be allowed in the building.
- Maintaining an environment not conducive to pests and insects, which is clean, cool, dry, and well ventilated.
- Determining the tolerance level for a given pest population: How much damage is acceptable?
- Understanding the biology and life cycles of the pests involved in order to realistically develop strategies of mechanical, cultural and biological (and possibly chemical) control.
- Selecting and applying control methods, emphasizing the “least chemical” treatments.
- Evaluating treatment through continued monitoring.

If chemical control becomes unavoidable, archival institutions should enlist the services of a commercial fumigator. According to the Chicora Foundation (1994) commercial fumigator should maintain detailed records of all pesticide applications and make them available to the archival institution. The reports should include information on the target pest, the product used, the active ingredient of the product, the dilution used, the date applied, the total amount used, where (exactly) the product was used, the individual who applied the pesticide and completed the report, and any additional information which might be important (for example, complaints about the smell, or damage to collections).

The storage conditions of records and archival materials are key to long-term strategies for insect pest control in archives (Child 1999). Buildings and storage equipment can positively contribute to keeping holdings secure from pest invasions as well as controlling the environment, which is key to minimizing infestations by pests. Storage of records and archival materials are described in the following pages.

2.8.5 Storage of records and archival materials

The storage environment can have a significant effect on the long-term preservation of records and the information they contain (Read 1994). As a result, a number of experts in Africa believe that preservation efforts should lay more emphasis on proper storage of documentary materials than on expensive reformatting and deacidification projects (Alegbeleye 1999). Proper storage of records and archival materials depends on good accommodation and equipment. The following subsections will shed more light on the concept of archival buildings and storage equipment.

2.8.5.1 Buildings

Records and archives need protection from the environment and biological factors. Protection of records and archives begin with the buildings in which they are housed. In fact, buildings have been characterised as “the first line of defence against a severe climate and various disasters” (The National Archives of the Netherlands *et al.* 2001:77). Thus, architecture is key to the preservation of records and archives (Mackenzie 1995:129; Mazikana 1997:145). However, many archival institutions in Africa are housed in buildings that are inadequate (Mazikana 1997:145). For instance, Botswana’s major preservation problem stems from the lack of suitable buildings to house information resources (Kufa 1997:159).

Very little attention is being given to the nature of archival buildings in tropical countries (The National Archives of the Netherlands *et al.* 2001:77). For instance, surprisingly enough the IFLA Section on Library Buildings and Equipment has paid little attention to the role of building designs in the preservation of documentary materials (Bisbrouck & Chauveinc 1999). Another problem encountered in developing countries is that there are no national standards for archival buildings (The National Archives of the Netherlands *et al.* 2001:80).

The most costly capital investment for archives is in the building that stores the materials (Rhys-Lewis 1996:15). The utmost care should be taken in acquiring an archival building. Archival buildings can either be custom built or adapted existing buildings. Most archival institutions in Africa adapted premises to house their holdings (The National Archives of the Netherlands *et al.* 2001:89). Adapted buildings are at times old and dilapidated structures (Khayundi 1995:32; Mbaye 1995:43). In addition, buildings that were not initially designed for housing archives only lend themselves to the necessary functional adaptation with difficulty and imperfectly (Duchain 1977:20; Mbaye 1995:43). For instance, the widely used international concrete box and iron sheet style is not easily adaptable to local climatic conditions (Gut & Ackerknecht 1993). In that light, Thomas (1987; 1988) advised that it was better to spend scarce resources on simple and custom-designed buildings that are environmentally friendly than wasting them on recycling and adapting old and unsuitable buildings.

A custom-designed building offers many advantages. It is possible to choose building materials that are suitable for the preservation of archives and records as well as determining the size of the building. Selection of the right building materials is key to reducing the impact of climatic factors on the building and the materials housed in it (Daniel *et al.* 2000:45; The National Archives of the Netherlands *et al.* 2001:90). Building construction materials such as wood, stone, and brick all have different thermal and vapour characteristics (Kerschner 1992).

Materials used to construct the building are important because they will determine the environmental conditions that can be maintained inside the structure. For example, horsehair and plaster walls will retard moisture penetration to a greater extent than will modern drywalls. Thermal and vapour qualities of a building are also greatly affected by its construction. For instance, it would be dangerous to introduce additional humidity into an uninsulated wood frame building during cold winter months. On the other hand, a brick or stone building with plaster interior walls may safely support a calculated level of additional humidity (Kerschner 1992).

Another important factor that should be taken into consideration when designing a new archival repository is the size of the building. According to Duchain (1977:21) the building

should not be extremely big so as to occupy a large surface area. One way of getting round the problem would be to have multiple buildings for archives. While this approach is not cost-effective in terms of economies in construction, equipment and staff, since everything would be dispersed instead of being centralized at one place, its major attraction is spreading risks arising from a disaster. In case of a disaster documents in other buildings might survive, as it might be possible to confine the disaster to a specific building depending on the nature of the disaster. The situation would be different when dealing with documents in one building. There is a high likelihood that the documents would be destroyed together.

Irrespective of whether the building is adapted or purpose built, the choice of the ideal site is very important. However, it is very difficult to define the “ideal site” because of the varying circumstances that each area has. It is generally agreed that the sites listed below should be avoided because of the disadvantages they have to the preservation of records and archives (Duchain 1977:22; The National Archives of the Netherlands *et al.* 2001:87). The sites to be avoided are:

- low-lying land liable to flooding and land slides;
- land near rivers;
- land liable to the effects of high seas;
- damp and swampy sites;
- vicinity of heavy industries where a good deal of sulphur dioxide is prevalent, for sulphur dioxide damages paper; and
- military installations or buildings of strategic importance.

In addition, the site should be large enough to accommodate future expansion. According to Duchain (1977:29) and Thomas (1990b) there should be sufficient room for extensions covering a period of ten years from the time the building is constructed. The drainage should be good and the water table should be at least six to seven metres down. The site should also be separated from other buildings by streets so that an outbreak of fire in nearby buildings will not endanger the archives building.

For many years it was the trend to erect the archives buildings near or in the immediate vicinity of government buildings and offices to facilitate easier transfer of records. With the establishment

of records centres and intermediate depots the tendency nowadays is to erect archives buildings in the suburbs, preferably near a university so that the holdings would be easily accessible to researchers. Ideally, the building should be situated near regular public transport so that it would be easily accessible to the public. According to Duchein (1977:24) easy public access to the building should be “a prime consideration in the choice of a site”.

The building should have strong rooms (storage areas), working areas for staff and areas open to the public (offices, exhibition areas and reading rooms). The strong rooms should be separated from other areas. The strong rooms should be designed for the protection of records and archives, and not for the convenience of people. The materials for building should be brick and concrete. The walls should be able to resist fire for a minimum of two hours (Duchein 1977:34). All openings in the walls of strong rooms should have fire-resisting doors. The design of the roof should be dictated by local climatic conditions. However, flat roofs should be avoided because they do not facilitate an easy flow of rainwater. Slate and tile are the best roofing materials. Metal roofs (aluminium, zinc, copper, stainless steel) though cheaper than the latter, should be avoided because they are very good conductors of heat (Duchein 1977:34). Metal roofs are also susceptible to corrosion, especially, in areas with sulphurous gases. The building should be positioned in such a way that it takes advantage of any natural shade or protection against the wind (Duchein 1977; Thomas 1987). For instance, to avoid direct sunlight it is better to orientate the building to the north, in the northern hemisphere, or to the south in the southern hemisphere (Duchein 1977:25).

Above all, the building should be constructed according to agreed local building standards. According to Crespo and Viñas (1990) construction standards should be particularly stringent for archives in tropical countries. The outer walls, foundations, doors, windows and roofs should be in keeping with the climatic conditions, which constitute the major challenge to the preservation of documentary materials in those areas.

2.8.5.2 Storage equipment

Storage furniture for records and archival materials can contribute to the deterioration of the collections they house. Storage furniture, especially shelving, made of wood has traditionally been popular for reasons of aesthetics and ease of construction. However, wood shelving has

been abandoned in favour of metal shelving. Wood is highly combustible. Termites and wood-boring insects can easily attack it. Wood composites, and some sealants and adhesives emit harmful acids and other substances that are harmful to archival materials. Wood is also expensive as compared with metal. Nowadays, metal shelves are widely used for storing records and archives, although some countries have tried some other shelving materials made from slate, concrete, cast iron and heat toughened plastics of polyester type (Duchain 1977:38). The major advantages of metal shelves are that they are adjustable to fit various sizes of archival objects, durable and fire resistant (Mackenzie 1995:132).

The archivists have to make a decision as to which metal shelving to use. Aluminium, baked enamel and treated steel have been widely used for shelving materials (Duchain 1977:39). Initially, baked enamel shelving was recommended as it was regarded as chemically stable. Baked enamel has been a particularly attractive choice because it is readily available, competitively priced, strong, and durable. Questions, however, have been raised about the possibility that the baked enamel coating may give off formaldehyde and other volatiles harmful to collections if it has not been properly baked. Steel storage furniture with various powder coatings is now recommended because tests have indicated that the coatings are chemically stable, present minimal threat of volatile evocation, and so are safe for the storage of valuable materials.

Anodised aluminium storage furniture is another option. This uncoated metal is extremely strong yet light in weight. The metal itself is reported to be non-reactive and, since it has no coating, off-gassing problems are eliminated. Anodised aluminium is considered by many to be the best choice, especially for highly sensitive materials, but it tends to be the most expensive.

The choice of suitable shelving is fundamental to the preservation of archival materials. In addition, shelving should be tested in-house with the organic solvent methyl ethyl ketone (MEK) before use (Ogden 1996b). Although the MEK rub test does not give perfect results it can give a rough indication on whether or not the coating was properly cured in circumstances where professional testing services are not readily available.

2.8.6 Handling and good housekeeping

Physical handling compromises all physical formats. Much of the damage that records and archives sustain is due to bad handling. Records and archives can be damaged by mishandling, carelessness, or by deliberate criminal activities such as theft and vandalism (Thomas 1987). This section elaborates on handling and good housekeeping with the exception of issues pertaining to criminal activities in the preservation of records and archives which are dealt with in section 2.9 below.

Beyond the provision of favourable environmental conditions and suitable buildings and equipment, the preservation strategy should include instructing staff and public alike in the careful handling of original materials and good housekeeping. Proper storage and handling of records and archival materials can lead to future savings by minimizing the need for repair of materials. According to the National Preservation Office (2000a) institutions should instil a culture of good handling practice among staff and transmit this culture to all its users.

Staff and user training is one of the most important preventive measures in the preservation of documentary materials. The goal of preservation education programmes should be to build awareness within the archival user community of the fragile, irreplaceable nature of archival holdings, and to teach and encourage improved care and handling practices. Printed materials, training sessions, seminars, and conferences are typical communications vehicles that could be employed for this purpose.

One of the important aspects of archival preservation is the development of handling practices that will further the longevity of the collection. Instructions for proper handling and use of archival materials should be prepared for the guidance of all members of staff and researchers. Rules governing use and handling of records should be prominently displayed and enforced.

Researchers and staff should also make sure that their hands are clean before using public records. Natural oils on hands transfer to documents and leave permanent oily spots. While invisible initially, finger grease becomes all too visible as it oxidizes and collects dirt. Inexpensive gloves can be used to provide additional protection. Pencil, instead of pens (especially ball point and felt tip pens) should be used on records and archives as the ink may

run, bleed, or transfer onto other pages. Eating, drinking, and smoking around records and archives should be avoided as the spills and stains are generally permanent.

According to Ward (2000:44) archives are used less extensively, but more intensively, than library materials. Unlike in the case of libraries where frequent handling could be deflected from one book by purchasing more copies, archives tend to keep unique materials. That means that some archival documents with some perceived significance would be constantly used. Such concentrated handling can expose documents to unstable environments for extended times. Documents may last for years if stored in a stable environment and not used. Documents deteriorate due to use in varying environmental conditions. Variations of temperature and RH can negatively affect the life span of documentary materials.

Generally, the environmental conditions maintained in the repository are not comfortable for human beings even if they elongate the life span of records and archives. Temperature and RH are not controlled in the reading room in the same manner as in the repository in order to accommodate human health and comfort. Materials should not be reserved for researchers and left in the reading room for lengthy periods because environmental conditions in the reading room are not always conducive for their preservation.

There should be a programme of monitoring high-use items so that reformatting strategies could be used to deflect frequent handling from the original. As discussed in section 2.7 above, reformatting methods like microfilming, digitisation and photocopying can save the originals from being inadvertently damaged due to frequent handling and exposure to unstable environments. However, documents are often unnecessarily damaged during reformatting. For instance, photocopy machines with flat copy platens necessitate jamming the binding flat in order to get a good image. Better machines are those with edge platens or other features that allow a file page to be copied with the file open only to 90° instead of 180°. It is always recommended that researchers should not photocopy archival records without supervision (National Preservation Office 2000b). Only staff members should do photocopying of records and archives of special value. Photocopying should be done only if it can be done without causing damage to the records and archives themselves.

Good housekeeping in the form of dusting, cleaning and general monitoring of the repository is key to extending the life of documentary materials. For instance, dust can adversely affect magnetic tapes. Cleanliness offers many benefits. Cleaning should be regular and undertaken with care and under supervision. Clean surroundings discourage fungi, insects and pests. Materials could be examined during cleaning in order to provide an early warning of biological or chemical damage.

Appropriate materials and equipment, which remove rather than redistribute dirt and dust, should be provided. Cleaning cloths to which particulates adhere rather than dusters, which merely spread them around in different places, should be used. Floors should be vacuum cleaned (not swept) and damp-mopped once a week. Cleaning agents must be non-toxic and pose no threat to the holdings from solvent fumes or abrasives. Products containing oil, chlorine, alum, peroxides, and ammonia should be avoided.

In general, good air circulation should be maintained in storage areas. Records and archives should never be stored directly against walls but should instead be at least three inches away from them to facilitate movement of air around the records and archives, and to avoid the occurrence of pockets of damp air. As a rule, records and archives should not be stacked in piles on shelves. Good housekeeping can help staff to identify threats to records and archives before it is too late.

2.9 DISASTER PLANNING AND SECURITY OF RECORDS AND ARCHIVES

Disaster preparedness and security are vital to the preservation and protection of archival materials. Disaster planning helps the organisation to respond efficiently and quickly to an emergency, minimizing danger to staff and damage to archival holdings and the building. On the other hand, security protects items against theft or deliberate or unintentional damage and destruction.

Records and archives are vulnerable to a variety of disasters. Disasters take many forms. That becomes clear when reading the report on the state of preservation in the war-ravaged Angola (Antunes 1993). The Director of the National Library of Angola indicated that their greatest problem was not how to keep collections free from insects, humidity or dust. Their main

concern was how to save the few remaining collections from being destroyed by the war (Antunes 1993). The report demonstrates that our documentary heritage is vulnerable to a variety of disasters in the course of its history.

Until recently information professionals have not prioritised disaster preparedness (Buchanan 2000:159; Law 1999:3). Depending on which part of the globe one is on, risks and hazards to documentary materials might include insects and rodents, mould and humidity, hurricanes, tornadoes, flash flooding, earthquakes, forest fires, volcanic eruptions, power outages, leaking roof and pipes, sprinkler discharges, fuel or water supply failures, chemical spills, arson, bomb threats, and acts of war and terrorism. In other words, a disaster include both:

the cataclysms that overwhelm human efforts in a moment of geological, meteorological or military fury, and those more insidious disasters which build up gradually and wear away the effects of human effort over time, with cumulative and systemic consequences (Sturges 1999:167).

Any of these disasters can strike an organisation at any time, but if an institution is prepared, the damage may be decreased or avoided. The need to prepare for disasters is recognised by ESARBICA, ICA, IFLA and UNESCO alike. These organisations would like to see an agenda set for dealing with disasters. Indeed, the Pan-African Conference on the Preservation and Conservation of Library and Archival Materials held in Nairobi in 1993 with the support of IFLA, ICA and UNESCO endorsed the need to develop and implement disaster plans in archival and library institutions (Recommendations 1995:170).

According to The Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict, which was prepared by UNESCO, member states that are signatories to the Convention are supposed to adopt preventive measures to protect cultural heritage during war and peace times (Varlamoff 1999:162).

Specifically, a disaster can be defined as an unexpected occurrence inflicting widespread destruction and distress and having long-term adverse effects on the conduct of normal activities. In the context of the information environment, Alegbeleye (1993) defined it as an event that “results in the sudden removal of records and documents from accessibility and use” (Alegbeleye 1993:5).

Natural disasters, such as the 1966 Florence flood that destroyed 2 million volumes of cultural objects in the Bibliotheca Nazionale Centrale (Feather 1991:2; Law 1999:3; Varlamoff 1999:162), and the Cyclone Eline's February 1999 assault on Mozambique, South Africa and Zimbabwe, make all of us acutely aware of our vulnerabilities to disaster (Vumbunu 2001:122). Equally, the 11 September 2001 terrorist bombing of the World Trade Centre and the Pentagon Library in the US was indicative of the fact that disasters are part and parcel of human existence (Harrison 2002). Thus, disaster planning or emergency preparedness is fundamental to the preservation of records and archives. Disaster plans are essential for:

- minimizing disruption of normal operations;
- minimizing the economic impact of the disaster;
- training personnel in emergency procedures; and
- providing for rapid and smooth restoration of services (Alegbeleye 1993:8-9; Ogden 1996b).

Despite the fact that disaster plans are important many institutions do not seem to take the matter seriously (Feather 1991:69; Jenkin 1987:2). According to Feather (1991:69) a disaster plan is central to the preservation strategy and is a key element in preservation policy-making. A disaster preparedness plan allows an organisation to plan and make decisions about emergency response and recovery. According to Lyall (1995) a disaster plan is:

a document which describes the procedures devised to prevent and prepare for disasters, and those proposed to respond to and recover from disasters when they occur (Lyall 1995:103)

A systematically organized, formally written plan enables the organisation to respond efficiently and quickly to an emergency, minimizing danger to staff and damage to collections and the building (Ogden 1996b). Typically, a disaster plan has three phases:

- before the disaster (preventive and preparedness): implementing measures to remove or reduce danger as well as being ready by having identified resources, materials, services and procedures in place to deal with problems when they occur;
- during the disaster (response): knowing how to respond to minimize damage quickly and efficiently; and
- after the disaster (recovery): knowing what to do to recover damaged material.

The plan needs to address all types of emergencies and disasters that the organisation is likely to face. One way of ensuring that potential risks are taken care of in the plan is to conduct a risk assessment before formulating the plan. The purpose of a risk analysis is to identify those occurrences which pose the greatest threat to the holdings and the organisation. Thereafter, the existing preventive and preparedness procedures are identified as well as response and recovery ones (Lyll 1995:105).

The plan should be reviewed with staff regularly, at least annually. The plan should include a list of steps to follow if a disaster strikes, list with addresses, names and telephone numbers of key salvage staff and the disaster team and sources of assistance and supplies that may be needed. The plan should be written clearly and understood by everyone likely to be involved. The lists and instruction should be kept up-to-date. Much valuable time can be lost during emergencies if staff members are unfamiliar with recovery methods (Ogden 1996b). Copies of the plan should be distributed to all personnel responsible for emergency prevention and recovery. Several copies of the plan should be stored off-site as well as in the building(s) where materials are housed.

In addition to institutional disaster preparedness some institutions in Canterbury (New Zealand) are putting into practice the concept of communal disaster supplies (Campbell 2001). The co-operative approach to disaster management is strongly encouraged by UNESCO (2000). The UNESCO Memory of the World Programme advises institutions to be “prepared for any type of disaster; contact and consult other institutions to share information and experience, and with a view of regional co-operation” (UNESCO 2000).

Before concluding the section on emergency preparedness it is essential to briefly look at some of the disasters that might affect records and archives as well as compromising their security. Water and fire damage, and theft and vandalism cause the most recurrent damage to archival holdings (The National Archives of the Netherlands *et al.* 2001:111). Some of the problems associated with these factors are discussed in the following sections.

2.9.1 Fire damage

Fire is regarded as one of the greatest hazards for documentary materials and it occurs much more frequently than is often thought (Trinkaus-Randall 1995). The great library at Alexandria established in the third century B.C. was destroyed by fire first in 47 BC during the time of Julius Caesar and then finally in 373 AD. Fire caused extensive damage to records of the Secretariat Office in Kenya (Nairobi) in 1939 and in Pujehun town in Sierra Leone, 250 000 government records were lost to fire in 1991 (Alegbeleye 1993:14). The Nairobi fire destroyed a vital portion of central government records (Musembi 1984:31). The Pretoria City Council in South Africa lost a range of records dating back to the 1920s in a fire at its Munitoria Building in March 1997 (Directorate State Archives and Heraldic Services 1998-1999:23). Some of the records that were burnt included building plans and title deeds. Because of the speed and totality of the destructive forces of fire, it constitutes one of the most serious threats.

Damage caused by fire can be even more serious than that caused by water. If collections survive at all, they are likely to be charred, covered with soot and smoke, distorted, brittle from exposure to high heat, wet from water used to extinguish the fire and smelling of smoke. Text blocks will warp and plastic will melt (Trinkley 2001). In most cases, fire causes paper records to be unusable.

Archives and records offices frequently contain numerous fuels. These include archives, manuscripts, records, combustible interior finishes, cabinets, furnishings, and laboratory chemicals. It should be recognized that any item containing wood, plastic, paper, fabric, or combustible liquids is a potential fuel. They also contain several common, potential ignition sources including any item, action, or process which produces heat. These encompass electric lighting and power systems, heating and air conditioning equipment, electric office appliances and smoking.

Cellulose nitrate films discussed in section 2.6.3.2 above could be added to the list of fire hazards. The heat produced by the decomposition of nitrate films can result in ignition by spontaneous combustion (The National Archives of the Netherlands *et al.* 2001:112; Volkmann 1980:18). Nitrate films become a fire hazard when they are old and when they are stored in non-conditioned storage areas, especially, in tropical countries where temperatures

are very high. Equally, biological agents like termites, rats and mice must be kept under check because they can be destructive to electrical wiring. Uninsulated electrical wires are an electrical fire hazard. As discussed in section 2.8.5.1, fire resistant materials like tiles and slates can be used in the construction of roofs of archival buildings to minimize fire risks.

The detection of fire at an early stage can prevent extensive damage to archival materials. ICA recommends smoke detectors instead of heat detectors, because smoke detectors can detect a smouldering fire in its low energy stage (Fröjd *et al.* 1997). Where ignition from a smouldering fire is likely, they can give warning very early in the fire development. Smoke detectors include ionization type, photoelectric beam or spot type, and infrared type (Thomas 1992).

Several fire-suppression methods are available. The major categories of fire extinguishers are: automatic fire suppression systems, hand held portable fire extinguishers and water hose reels. The commonly used methods are the CO₂ gas system, dry-pipe sprinkler and wet-pipe sprinkler systems and micromist or water mist systems. There is a debate about fire suppression systems in archival circles. One school of thought argues that water should only be used as a last resort in view of the damaging effects of water on archival materials (Anderson & McIntyre 1985). On the other hand, the other school of thought argues that it is better to use water because it effectively extinguishes most fires (Alegbeleye 1993:39).

For instance, a CO₂ gas system is only suitable for smaller compartments, that is, spaces which can be made airtight and which are not normally occupied by people. Wet-pipe sprinkler systems are a reliable and safe extinguishing method and are relatively easy to maintain (Thomas 1992). If water-based fire protection systems, such as sprinklers, are to be installed, provision should be made for rapid drainage. Wet-pipe sprinklers are highly recommended because the environmental and human safety aspects of water are known, unlike the possible impact from various chemical agents (Adcock. n. d).

Furthermore, the recovery techniques for water-damaged material are also known. Dry-pipe sprinkler systems are essentially the same as wet-pipe systems except that the pipes in the protected area contain pressurized air. When the sprinkler is activated a valve opens allowing

water to flow into the pipes. This lessens any threat of water leaking into collection areas. Every institution should have at least one method in operation.

Although water mist systems, which are about to become available commercially, look promising, automatic sprinklers are now considered by most fire safety professionals, archivists, and conservators to be the best protection from fire for records and archives (Ogden 1996b). The preferred type of sprinkler system depends upon the institution's objectives. It should always be borne in mind that all sprinkler systems require a reliable water source and power pressure. In addition, portable fire extinguishers should always be available, even if an automatic fire suppression system has been installed (Adcock. n. d). All fire-suppression systems should be regularly inspected and properly maintained. There should be a suitable number of hand-held extinguishers (CO₂, water, or foam according to the likely cause of fire, that is, electrical or chemical) strategically placed. However, ICA recommends water extinguishers because the residue of foam and powder extinguishers might affect archival materials (Fröjd *et al.* 1997).

Due to environmental concerns the use of halon 1301 (bromotrifluoromethane) gas is no longer recommended. Preservation professionals now recommend wet-pipe sprinklers for most records and archives (Artim 1999; Ogden 1996b). In addition, water misting suppression systems have become available within the last several years that can provide fire suppression using much less water than conventional sprinkler systems. Fine water droplets, or mist systems can provide automatic fire suppression even in locations where reliable water supplies do not exist (Artim 1999). Mist technology was originally developed for offshore uses such as on board ships and oil drilling platforms. For both of these applications, there is a need to control severe fires while limiting the amount of extinguishing water, which could impact vessel stability.

2.9.2 Water damage

Protection from water damage is essential to the preservation of records and archival materials. In general, water damage on wet records is easier to deal with than fire related damage (The National Archives of the Netherlands *et al.* 2001:114). Sources of water damage are leaking roof, gutters and drains, water pipes, steam pipes, lavatories, mechanical air-

conditioning equipment, hurricanes, tornadoes and floods. For instance, a hurricane destroyed valuable records and private manuscripts at the National Archives of Swaziland in 1984 (Alegbeleye 1993:14).

The prevention of water damage leaking and burst pipes can be prevented through proper storage of records and avoiding water and steam pipes in repositories. Materials should always be stored at least four inches above the floor, never directly on the floor. Repositories should not be located beneath kitchens and water reservoirs. Equally, sewage and water pipes should not run through the repositories. Storage in basements or in other areas where the threat of flooding is great should be avoided (Giovannini 2000:10).

If collections must be stored in areas where they are vulnerable to flooding, water-sensing alarms should be installed to ensure quick detection of water. The alarms should be connected to a central monitored security system. Staff should know the location of water pipes that run directly over repositories. Water pipes should also be equipped with strategically positioned flow control valves.

Roofs, gutters and drains should be constantly checked and cleaned to avoid blockages. Large trees should not be allowed to grow close to archival buildings because their leaves can block gutters and drainage resulting in leakages. Their roots can also suffocate the drainage system causing some drainpipe leakages.

2.9.3 Theft and vandalism

Adequate protection from theft and vandalism is key to safeguarding the valuable materials in archive repositories. The protection can range in complexity from simple locks to elaborate security systems. Usually the best protection is provided by perimeter intrusion alarms and internal motion detectors wired directly to the local police department or to another outside 24-hour monitoring agency. During working hours it is best to have only one entrance and/or exit, to be used by researchers and staff alike. If resources allow, the exit should always be staffed at all times. All other doors should be alarmed so that unauthorized use can be detected. Windows should be kept closed and locked.

Building keys and keys to areas where materials of special value are kept should be strictly limited. A list of key-holders should be kept current, and staff members should be required to return keys when they leave the institution. All storage areas should be kept secure and clear policy guidelines provided on who has access to what areas. Access to storage areas should be strictly limited, and a staff member should accompany researchers if they have to enter these areas.

Use of materials by researchers should be carefully controlled and strictly monitored. Researchers should never be left unattended. Bags, large folders and personal books should be left outside the reading area, and researchers should be allowed to bring only a pencil and paper into the room.

One area of security of archival materials that is often overlooked is employee theft. Employee theft can lead to considerable loss of archival documents. Archival institutions should make sure that they vet their employees before engaging them. The vetting can take the form of fingerprints that could be sent to the police or making a simple criminal history search on an individual's record. Educational and employment verification are equally important. In order to minimize theft archives should be careful on whom they hire and be sensitive to their problems.

2.10 PRESERVATION POLICIES

The formulation of preservation policies is an essential step in the preservation of records and archives. A preservation policy reminds the formulators the constraints they must all accept if important records are to be saved for present and future generations. According to Cloonan (2001:232) policy issues pertaining to preservation is a very neglected area. Earlier on, Foot (1997) had made the same observation. Surveys carried out at the National Archives and the National Library as well as major archives and libraries in Hungary confirmed that preservation policy formulation was a neglected area (Albrecht-Kunszeri & Kastaly 2000).

A survey carried out by Mbaye (1995) in lusophone and francophone SSA concluded that there was a "notorious" lack of preservation policies. Where claims were made that policies

existed, there were neither documents to support the claim nor coherent programmes to prove that preservation policies existed (Mbaye 1995:42).

Policies are important because they can outline explicitly the responsibilities of the archivists for the preservation of archival materials of all types in order to guarantee access to the information they contain, both for the current generation of archives and records users, and for generations to come. The Pan-African Conference on the Preservation and Conservation of Library and Archival Materials underscored the importance of preservation policies when it recommended that each country in Africa should establish a committee to develop a national preservation policy for implementation by its government (Recommendations 1995:170).

In general, policies set out goals to be achieved as well as guidelines for implementing them. In other words, policies are concerned with “why” and “what”, and plan with “what” (Menou 1991:51; van Orden 1988:75). On the other hand, procedures statements explain “how” and identify “who” is responsible (van Orden 1988:75). Organisational management is sustained by policies (Snyman 2001:14). According to Ranson (1995) policies can be defined as:

...statements which are typically expressed both in utterances and textual form. They have a distinctive and formal purpose for organisations and governments: to codify and publicise the values which are to inform future practice and thus encapsulate prescription for reform ... Policies are oriented to change and action, providing public intent of transforming practice according to ideal values (Ranson 1995:440).

Policy can be characterized as a set of principles, which guide a regular course of action (Menou 1991:50). According to Menou’s (1991:50) model, policies can be typified as:

- de facto, that is, they can be inferred by observing patterns of action and behaviour among key players;
- de jure, that is, they are stipulated in documents such as legal acts and regulations; and
- formalized policies codified in documents originating from stakeholders like professional associations and organisations.

Menou’s (1991:50) representation provides a useful framework for discussing preservation policies. The case for “codified and stipulated policies” or written policies has been articulated in the literature (Clayton & Gorman 2001:20). Simply stated, the matter that the literature has

been trying to come to grips with is: Should information agencies depend on de facto or written policies? Whatever approach is adopted in determining the nature of any policies there should be room for flexibility, dynamism and responsiveness to changing circumstances as advised by Rowland (1996:15) in his discussion of information policy. A flexible policy is likely to accommodate all role players in the preservation field. How do we balance the need to be accommodative on one hand and the desire to be formal and prescriptive on the other?

Although, there is no consensus on the answer to the question, many practitioners advocate written policies because they offer a lot of advantages (Clayton & Gorman 2001:21; Gardner 1981:222). De facto policies can be conservative in that they tend to uphold the status quo. Of course, de jure policies would be the best with funds, staff and other aspects of implementation and monitoring specified. Written policies serve as binding contracts between the information agencies and the stakeholders. They help set standards. Written policies can be used as tools for staff training and evaluation. In addition, they assure continuity as well as informing staff and users of the scope and goals of the preservation programme. They also facilitate a planned response to technological change (Clayton & Gorman 2001:21). Essentially, similar arguments apply to preservation policies.

A written preservation policy provides a framework, a set of parameters, within which an archive can operate. The policy serves to clarify objectives and facilitates planning and coordination of activities. It is as useful tool of guiding staff on what is to be done and why. It is also essential for setting priorities and making decisions. A preservation policy would provide a legal and institutional framework within which preservation activities should take place. A preservation policy is key to fulfilling the two seemingly irreconcilable missions of archival institutions, namely, preservation and access (UNESCO 2000). A preservation policy can be composed of a number of policy statements that cover areas related to facilitating access and preservation of the documentary heritage. Specifically, it should address issues related to how:

- documents can be made available without damaging them;
- documents can be preserved whilst being used;
- the deterioration of documents can be prevented, stopped or slowed down;

- the preservation conditions of holdings can be improved; and
- the content of documents can be safeguarded by creating their surrogates.

The policy should of necessity encapsulate the aims and objectives of the archival institution. According to UNESCO (2000) a good preservation policy must guarantee access to the information and minimise document deterioration. Governments ought to provide leadership in developing more expansive and inclusive national preservation policies in terms of both programmes and funding. Where applicable, the policies should link the efforts of national, provincial and private archives in preserving materials that document the national and cultural heritage and making their content widely available to all citizens.

2.10.1 Information contained in a preservation policy

This section draws extensively from the model provided by Maddick (1995:22). Preservation policies should contain information relating to the archives' preservation goals. Typically, the policy includes an introduction, statement of the philosophy of the archives, statement on access to originals and parameters of the preservation programme. The introduction can contain statements on the purpose of the written policy, why the policy was developed, and the scope of the policy, the policy's intended audience, how the policy was formulated and who was involved. The statement of the philosophy of archives could include the mission statement of the archives and the goals. The rest of the policy document can contain some of the elements, adapted from the Public Record Office of Northern Ireland's (1997) preservation policy document that are outlined below:

- Common standards for the preservation of records: fundamental preservation standards for their physical security and protection should be applied.
- Acquisition and selection of records: to meet their preservation obligations under archival legislation and save important records for future generations, the archival institutions must gain access to and control all records of enduring value relating to South Africa.
- Records storage: storage is the primary means of guaranteeing the physical security and long-term survival of records.

- Copying of records: when considering various methods of preventive preservation, archival institutions should be prepared, where feasible, to copy archival materials onto alternative and more physically manageable mediums.
- Public displays and exhibitions: while seeking to encourage public awareness of archives, archival institutions should also be aware of all risks to the physical safety of records associated with placing them on open display. Wherever records are publicly exhibited, the office must ensure that proper preservation standards are observed throughout the periods of public showing.
- Conservation and repair of records: whenever necessary, archival institutions must submit any record(s) that are suffering or are at risk from serious physical damage or deterioration to remedial chemical and physical treatments.
- Disaster management: if archival institutions are to safeguard their records adequately, they must have effective procedures in place to prevent, or enable them to react swiftly to, sudden, unexpected events which could have destructive consequences for all or part of their holdings. Such procedures should be integrated into a fully functional disaster plan.
- Housekeeping.
- Ethics: preservation must respect and maintain the integrity of original material.
- Access.

Essentially, policies are planning documents. They compel staff to think through the archive preservation goals as well as identifying the short and long-term needs of the programme. Policies provide information to assist in allocating resources. The success of preservation policies depends upon how they are taken at the highest level, and upon managers and staff having a clear awareness of the preservation goals. Staff should be aware of the existence of the policy as well as their own preservation responsibilities. Preservation plans can then be formulated on the basis of policies.

2.11 PRESERVATION PLANNING

The success of a preservation programme hinges upon preservation planning (Conway 1990:209; Ogden 1996b; Ogden 1999). Conway asserts that “archival preservation, when most effective, requires that planning precede implementation” (Conway 1990:209). Planning an

archives' preservation programme helps to ensure the systematic maintenance of, and access to the archival information resources. Preservation planning has been defined as a process of setting present and future preservation agendas. It identifies resources that are required for the preservation of records and archives as well as setting priorities to address holding maintenance (Jones & Ritzenthaler 1988:201; Ogden 1999). In other words, planning is a systematic balancing of the aims and resources of an organisation.

The result of planning process is a plan in the shape of a system of binding organizational measures, procedures and stipulations that lead to the achievement of the set aim. A preservation plan helps to ensure that limited resources are used consistently and economically. It also helps to raise awareness of the archives' preservation problems as well as the institutionalisation of the preservation process and increasing knowledge among staff of issues in preservation (Reed-Scott 2000:84).

According to Ogden (1996b), the objectives of a preservation plan are to:

- delineate an institution's preservation needs and chart a course of action to meet these needs for its collections;
- provide the framework for carrying out established goals and priorities in a logical, efficient, and effective manner;
- maintain continuity and consistency in a preservation programme over time;
- validate the role and importance of preservation, helping to make preservation an equal partner with acquisitions and interpretation;
- aid in securing necessary resources to assist with implementation of recommendations; and
- to record the past and current preservation activities and shape the future efforts of an institution.

Designing a preservation plan is a management activity. It does not require technical expertise in paper chemistry or hands-on conservation skills (Child 1999a). Preservation as an aspect of collection management is much like any other management decision-making process involving allocation of available resources to activities and functions important to achieving the objectives of an organisation.

According to Child (1999a) and Ogden (1996b) the basis of formulating the preservation plan is the organisation's mission statement and a needs assessment survey. On the other hand, Garlick (1990:258) and Reed-Scott (2000:84) identified three major phases in preservation planning. The first phase comprises preservation needs assessment, whereby background information is gathered. The second phase is concerned with policy and procedure formulation. This phase provides tools for organising and evaluating the plan. The third phase identifies and implement holdings maintenance projects.

The needs assessment survey analyses the policies, practices, and environments that affect the preservation of the collections. It reviews the general state of the documents. It pinpoints specific preservation needs, proposes actions to meet those needs, and prioritises the recommended actions.

In other words, a survey identifies hazards to the records and archives, taking into consideration such factors as environment, storage, security and access, housekeeping, conservation treatment and policies and practices. Environmental factors to be considered are light, relative humidity, temperature and gaseous pollutants (Child 1999a; Ward 2000:51). In terms of security of the holdings, fire detection and suppression systems should also be assessed. In the same vein security systems, both mechanical and procedural, and disaster planning should be evaluated. The survey should examine staff and user training in the care and handling of documents. In addition storage equipment must be evaluated.

The product of the planning process is the formulation of a written preservation plan (Jones & Ritzenthaler 1988:201; Ogden 1999; Ward 2000:52). According to Hazen (1990:348) and Ward (2000:52), the plan should explicitly address the following elements:

- goals of the preservation programme;
- activities necessary to reach the goals;
- designated responsibility for each activity;
- resources required to carry out each activity; and
- a schedule for beginning and completing each activity.

It is mandatory that preservation plans reflect local needs and resources (Garlick 1990:259). Furthermore, plans should serve as working tools for achieving agreed-upon priorities over a

set period of time. Planning should involve as many members of staff as possible so that they would assume ownership of the preservation programme. Acceptance of the plan by staff is an important factor that could determine the difference between the success and failure of the preservation programme.

The plan should include both short- and long-term goals. For example, the long-range goal for Mpumalanga, Limpopo and Ulundi provincial archives may be to plan and build a custom made building that meets local preservation standards since at the moment they do not have such buildings. On the other hand, short-term goals may be to either create and maintain an environment that retards the deterioration of records and archives and provides for recovery in the event of a disaster or revise staff training procedures in order to improve appreciation of preservation needs of the institution.

Once the preservation plans have been formulated financial resources are needed to translate them into action plans. The financial budget can be based on the objective and task method model, that is, it should be based on defined objectives, tasks to be performed and estimates of performing the tasks (Kotler & Andreasen 1991:367). According to Ritzenthaler (1993:14) little data is available on exactly how much institutions with coordinated preservation programmes actually spend.

Child (1999a) pointed out that preservation planning does not always lead to additional budget lines or substantially increasing existing ones. For example, activities such as training staff and users in care and handling of materials, carrying out systematic holdings and stack maintenance, adhering to preservation criteria when buying storage furniture and supplies, and incorporating preservation considerations into all policies and procedures can often be accomplished with existing personnel and budget allocations.

Project planning tools such as the program evaluation and review technique (PERT) and critical path method (CPM) can be used for planning and scheduling the preservation plan (Burke 1993:2). These techniques can provide a framework for defining the activities to be done, integrate them in a logical time sequence and finally afford a system of dynamic control over the process of the plan. These models ensure that all the needed tasks are due in time and

done on time. Some of the planning activities that an archival institution can undertake in order to preserve its documentary materials are outlined at Appendix Fifteen.

Planning is not a panacea for all preservation problems. Indeed, Darling (1981b:182) noted, “[p]lanning is not the solution to the preservation problem, but it is an essential tool for drafting responses to the preservation challenge”. Planning for preservation will help archivists to preserve their archival holdings for current and future use.

The formulation and implementation of preservation policies and plans, and the enforcement of preservation principles in archival institutions is going to be possible if the archive staff is armed with the appropriate and preferably the most up-to-date knowledge on preservation issues (Albrecht-Kunszeri & Kastaly 2000:10). The next section looks at preservation training and education issues with special reference to Africa. Archival training in South Africa is dealt with in Chapter Three.

2.12 PRESERVATION TRAINING AND EDUCATION

Education and training are concerned with the development of knowledge, skills, and attributes necessary for individuals to live meaningfully and to contribute positively to society. Training relates to specific processes and procedures. It should provide people with techniques in how to apply rules and standards. It covers how principles are applied, in a practical programme. In the context of this study, education relates to general principles and abstract theories of preservation. Education explains the broader relevance of concepts whereas training programme provides specific techniques. In fact, education and training are keys to developing life-long skills and expertise (Yusof & Chell 1998:25).

The preservation of records irrespective of their format and media that they are captured on, to a great extent, hinges on records managers and archivists with necessary skills and knowledge to deal with the records at every stage of their use by society.

2.12.1 State of preservation training and education in Africa

Contrary to the widely held view by Chida (1994:24), Kemoni (1996:48), Kirkwood (1994:14) and Olivier (1999:12), that lack of financial resources is hampering preservation efforts,

Darling (1981a:185), a preservation specialist, argued that the real impediment is not resource, but lack of preservation knowledge. According to Darling (1981a:185-186):

Financial constraints are serious and will become more so; but until the preservation field reaches the point at which most people know what ought to be done, the lack of money to do it on a scale appropriate to the need is not terribly significant.

In 1976 Warren Haas more or less underscored the secondary role that finances playing in the preservation of documentary materials. In his view, “the rate at which things get done is a function of money; whether or not they are done at all is a function of people” (Haas 1980:122). It is very unlikely that preservation efforts can succeed if the availability of resources is not supported by the right expertise.

Training at all levels can aid acquisition of knowledge and skills in preservation of records and archives. Knowledgeable and skilled staff are likely to expend scarce resources on projects that reflect the greatest preservation needs. Lack of essential knowledge and skills can be inimical to the preservation of documentary materials. For example, in Vietnam the poor physical conditions in libraries and archives, and problems of deteriorating collections were reportedly exacerbated by the well-meaning but uninformed activities of untrained staff (Henchy 1998).

Ultimately, preservation training and education are essential to the long-term development of preservation efforts (Feather 1990; Feather 1991:76; Kaplan & Banks 1990:267; Rhys-Lewis 1996:17; Rubin 1998:429; Swartzburg 1995:243). According to Kaplan and Banks (1990:270) and Garlick (1990: 263) archival training must begin to place greater emphasis on archival preservation, as the preservation of records and archives depends on adequately trained personnel. Raising the awareness of the importance of preservation without training staff in preservation management is a futile exercise (Eden 1997:123).

Education and training are fundamental to the improvement of the preservation of records and archives in Africa. It is no wonder that the joint consultation held in 1973 between the International Federation of Library Associations (IFLA) and the International Council on Archives (ICA) on the physical protection of documentary materials identified training of staff

as on of the four areas that needed urgent attention (Mazikana 1995:22). The importance of training was also reiterated by the Pan-African Conference on the Preservation and Conservation of Library and Archival Materials held in Nairobi, Kenya from 21 to 25 June 1993. In that regard, the Conference recommended the expansion of training programmes for librarians and archivists, in order to devote more attention to preservation issues and the underlying sciences (Recommendations 1995:170). Preservation and conservation of archival materials is a highly skilled and technical field requiring among other things a sound grounding in the underlying sciences such as physics and chemistry.

In a study conducted in the United States of America, Lowell (1986:2) recommended provisions for educational opportunities for archivists to learn preservation administration concepts and training programmes that produce archives conservators and archives conservation technicians. Despite its date imprint, the findings of Lowell (1986) are still relevant to SSA.

The availability of suitable and effective training for developing countries is limited (Rhys-Lewis 1996:17). A survey in Namibia (Töttemer & Stander 1991:43) concluded that, “the archivist profession is the most underdeveloped as far as training possibilities are concerned”. Archival training in general, and preservation training in particular is lacking in many institutions in SSA (Adjei 1993:45; Forde 1998:36; Mazikana 1997:150). Consequently, there are inadequate numbers of trained personnel to manage records and archives on the continent (Adjei 1993:45). According to Mwiyeriwa (1985:224), the provision of trained manpower “is the one thing which will make or break African archivology”.

Most African countries have paid little attention to the training of archivists and records managers (Mnjama 1996a:31). Similar observations were made by a UNESCO survey carried out by Mazikana in 1988 (Mazikana 1992:16). A lesser amount of attention is given to training and education of archival preservationists and conservationists. An overview of archives and records management education and training in Anglophone Africa revealed that out of the 27 institutions that were studied only seven, that is, 25.9% had a specific module dedicated to the preservation and conservation of records and archives (Ngulube 2001c:169-173). Perhaps, that partly explains why there is a dire lack of specialists trained in preservation

and conservation in SSA (Khayundi 1995:33; Mbaye 1995:43). But, because preservation is a significant component of every archivist's job, archival training must begin to place greater emphasis on general preservation principles.

The lack of training in preservation in most tertiary institutions in SSA is in stark contrast to the situation in the developed countries. A study by Cloonan (1997:182) found out that library and information services tertiary institutions in countries like Britain, France, Germany, Canada, USA and Scandinavian countries offered at least one course in preservation, although, preservation was not a required course. Cloonan (1994; 1997) was of the view that preservation topics should be integrated into core curricula and courses in preservation for library school students, and continuing education courses for practitioners.

As a result of lack of significant archival training in Africa, most archivists and conservationists have received training from overseas (Khayundi 1995:34; Mazikana 1995:26; Njovana 1992:117). Most of the training offered though good in itself, does not always suit African conditions although it produces high calibre archivists and other information professionals. The economic, political, climatic and technological environments in Africa are very different from those in the developed world.

There is an urgent need to localize the training of archivists and other information professionals so that it suits the indigenous environment (Kaniki 1999:233; Made 1979:25; Njovana 1992:118; Rosenberg 1999:18). In fact, Kaniki (1999:233) and Made (1979:25) have argued that education and training in information science is most effective and appropriate if provided in an environment that the learners would apply their skills and knowledge in. The case for the necessity of having programmes relevant to specific environments was made in section 1.3 of Chapter One.

Preservation and conservation of records and archives draws its methods from disciplines such as humanities and sciences, all in varying proportions. Routes into the field of preservation and conservation are wide ranging. Bines (1992:3) distinguished three ways of acquiring skills and knowledge:

- apprenticeship, where knowledge and skills are learned largely on the job;

- technocratic, where training focuses on the development of a knowledge-base through a formal syllabus or curriculum; and
- post-technocratic, where the focus is on knowledge-in-use and capability in practice situations.

All these routes have produced preservationists of acknowledged quality, with preservation benefiting from the diversity of background and approach. However, there is need to establish core competencies for preservationists through setting standards that define the range of necessary qualities and the threshold of achievement set for these qualities. In evaluating the knowledge and skills of preservationists, it would be necessary to use defined standards.

2.12.2 Skills and knowledge required for preserving records and archives

According to Feather (1990) different levels of knowledge and skill are required of different employees for carrying out preservation activities. Kathpalia (1990) placed preservation staff into two categories. On one hand, are specialists, that is, graduates who work as supervisors to organise facilities and guide staff where necessary; and on the other are technicians, that is, non-graduate staff who actually carry out the preservation and restoration work. Staff require basic skills and knowledge in preservation activities irrespective of their category in the conservation setting. Basic conservation skills and knowledge required for preserving records are presented at Appendix 10.

According to the National Council for Conservation-Restoration (UK) (2001), it is also within the conservator-restorer's competence to:

- develop conservation-restoration programmes or surveys;
- provide advice and technical assistance for conservation-restoration of cultural property;
- conduct research relating to conservation-restoration; and
- disseminate information gained from examination, treatment or research.

2.13 STANDARDS AND THE PRESERVATION OF PUBLIC RECORDS AND ARCHIVES

Standards have been with us for a very long time. According Batik (1989:3) the code of Hammurabi, which was developed over four thousand years ago, includes instructions for the manufacture of a brick, with specifications for "the clay, straw and water content". The

concise Oxford English dictionary defines a standard as a thing or quality or specification by which something may be tested or measured (Persall 2002:1399). Standards serve as benchmarks for the measure of quality and extent of service or product. In a sense, standards lead to standardisation of processes for the benefit of all their users. Thus, Val Verman (cited in Cox 1992) defines standardisation as the:

Process of formulating and applying rules for an orderly approach to a specific activity for the benefit and with the cooperation of all concerned, and in particular for the promotion of optimum overall economy taking due account of the functional conditions and safety requirements. It determines not only the basis for the present but also for the future development and it should keep pace with progress.

The use of standards ensures that procedures and products will meet certain requirements, and that these procedures and products will remain consistent over time.

While adherence to some standards is mandatory, in other cases compliance is voluntary. Voluntary standards demonstrate the best practice, which can be aspired to across a range of activities. This puts the onus on the practitioners and the end users to be aware of, and to insist on conformance with all standards governing a programme or service. Standards vary from exacting technical standards (specifications), through to broadly defined conventions (rules) to most generalised guidelines (models) (Avram, McCallum & Price 1982:197-189). Technical standards are specific, rigid and restrictive because they are, “an explicit definition that can be communicated, which is not subject to unilateral change without notice and which, if properly followed, will yield consistent results” (Crawford 1986:6-7).

Most of the standards listed at Appendix 14 would fall under this category. Standards are usually set through consensus and agreement. Conventions are relatively permissive and flexible as compared with technical standards. Application of rules or professional standards will result in similar and not necessarily identical products when applied correctly. The International Council on Archives (ICA) standards of archival description listed at Appendix 14 would be in this category. Guidelines provide a broad and general criterion against which to measure the quality of programmes or services. Handbooks, manuals and other guidelines provide models that can be generally applied.

Effective implementation of standards hinges upon regular review and consideration for reaffirmation, revision or withdrawal. Most standards documents include a statement to this effect. Each revision supersedes the previous edition, making it imperative that the users ensure that any standard used is the latest version.

Historically, standards are divided in two broad categories, namely, national and international standards. For instance, in South Africa there is the South African Bureau of Standards (SABS) at the national level, while the International Organization for Standardization (ISO) sets the tone at the international level in conjunction with ICA in the archival field. South Africa's representative to ISO is the SABS (South African Bureau of Standards 2000). On the other hand, the representative to ICA is the National Archives and Records Service of South Africa. The SABS is South Africa's official body for the preparation and publication of standards, and it is a statutory organisation governed by Act 29 of 1993. On the other hand, technical committees develop ISO standards. The International Organization for Standardization/Technical Committee (ISO/TC) 46 is responsible for technical standards of practices relating to libraries, documentation and information centres, indexing and abstracting services, archives, information science and publishing.

International and national standards are documented agreements containing technical specifications or the precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, processes and services conform to the desired requirements. However, most archives and archival institutions are not, in themselves, major producers of standards (Thomas 1990a). Apart from Australia, Denmark, Finland and New Zealand most of the standards on archival practice were either issued by governments, or, in the majority of cases, by national standards institutions. It does appear, however, that archivists were members of many of the committees, which drafted them. In Denmark the national archives in conjunction with the State Purchasing Office issue guidelines for the use of paper by state institutions. On the other hand, the National Archives of Finland is responsible for implementing a state administrative standard. The National Archives of Australia and Archives New Zealand have developed record keeping standards in their respective countries.

Like their counterparts in some parts of the developed world, national archives in developing countries should also take a strong leadership role in the development and application of standards that will ensure long-term access to, and preservation of records and archives. They should not relegate the task to professional associations and government. Prerequisite conditions for developing standards for archival practice suggested by the Working Group on Standards for Archival Description (1989) in the USA could be used as a model for developing archival standards in the developing world. As far as the Working Group on Standards for Archival Description (1989) was concerned, the development and implementation of standards required the archivists to:

- be aware of how the process of standards development and implementation operates;
- assess correctly the potential impact of standards;
- select sensible strategies for accomplishing their goals; and
- become actively engaged in the development and implementation process.

However, the area of standards development and implementation is grossly neglected in the developing world. It was evident from some discussions with archivists from the East and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) that standards are not part of archival practice in countries like Angola, Botswana, Kenya, Lesotho, Malawi, Mozambique, Namibia, Seychelles, Swaziland, South Africa, Tanzania, Uganda, Zambia, Zanzibar and Zimbabwe (see Ngulube 2001a). If we are to be fully confident about preserving and giving access to archives we need to know that our practices and procedures conform to established standards.

Through our awareness, promotion and adoption of existing standards and through our efforts to create new standards to support and govern our work, we can advance our storage, preservation and access to records and archives efforts in a very real and positive way (Ngulube 2001a). In a nutshell, using standards enhances the lifespan of the media and thus of the information recorded on it (Massachusetts Board (MBLC) 1992:19). The issue of standards as they pertain to the preservation of records and archives is further expounded on in the discussion on preservation of, and access to records and archives in Africa and South Africa in section 2.15 of this chapter and Chapter Three respectively.

The successful development and implementation of preservation standards in the management of records and archives require co-operation and collaboration among all the stakeholders. The public and government are among the important key stakeholders. It would be important to raise their awareness so that they support the preservation of records and archives as well as developing and implementing standards to support the preservation processes. The following section and section 3.4 in Chapter Three elaborates on the importance of awareness raising programmes.

2.14 RAISING AWARENESS OF THE IMPORTANCE OF PRESERVATION

There exists a general lack of awareness of preservation and conservation of documentary materials, particularly in Africa. This partly explains why the Pan-African Conference on the Preservation and Conservation of Library and Archival Materials held in Nairobi in 1993 recommended that information professionals should undertake awareness-raising activities at institutional and national levels (Recommendations 1995:169). Awareness-raising is very critical to the success of any archival activities in South Africa where archives services are not regarded as a high priority (Kirkwood 1996:26).

At an institutional level staff should be 'preservation and conservation' aware (Feather & Eden 1997:19). However, raising awareness of staff with little professional archival training in areas of conservation is extremely difficult (Feather & Eden 1997:19). If staff were aware of the importance of preserving records and archives, they would notice and quickly report damage to archival materials. Dealing with conservation problems at an early stage of their development would save resources because in most cases minor treatments would be enough to deal with a slight problem. Staff that are aware of the importance of preservation to prolonging the useful life of documents are likely to handle archival materials with the care that they require.

Users and other stakeholders should also be made aware about archival materials and the importance of preserving them. According to Eden and Feather (1997) many people coming into archives and record offices do not appreciate that archives should be handled with a lot of care because of the nature of the materials they are made from as well as the fact that most items are unique and irreplaceable. Users should be educated on the importance of

preservation of records and archives, and the inherent weaknesses of the media that they are recorded on.

The old adage: “an ounce of prevention is worth a pound of cure” applies directly to raising awareness among users of the importance of preservation. Outreach and public programming activities are fundamental to public awareness-raising.

2.15 PRESERVATION AND ACCESS TO PUBLIC RECORDS AND ARCHIVES IN AFRICA

The preservation of records and archives in Africa is generally unsatisfactory. Access to information contained in records and archives is also limited. The following subsections elaborate on issues relating to preservation and access to records and archives in Africa.

2.15.1 Preservation challenges

The International Federation of Library Associations (IFLA) and the International Council on Archives (ICA) were once commissioned by UNESCO to review preservation related programmes worldwide. The review revealed that the situation was highly unsatisfactory (Musembi 1995:11). The evaluation also showed that environmental factors like high and fluctuating temperatures and relative humidity, and inadequate financial resources hampered preservation activities in Africa (Musembi 1995:11).

Temperature and humidity are generally high and most archival collections end up being destroyed by bacteria, mildew and insects of which most of the archival institutions are ill-equipped to fight due to lack of funds. Thus, archival institutions in Africa face more or less the same problems in preserving their materials. They lack resources, equipment and trained manpower (Coates 1995:38; Endra 1993; Mazikana 1995:26). Materials and equipment for conservation are not available both at the national archives and tertiary institutions (Matwale 1995:52). As a result training and education in archival conservation has remained highly unsatisfactory.¹¹ There was also lack of sufficiently trained personnel to operate both existing

¹¹The observation is also based on the author's experience as a lecturer at the University of Natal and member of the Archives and Records Management Standards Generating Board of South Africa in the framework of the South African Qualifications Authority (SAQA) 2000-

and planned preservation facilities (Khayundi 1995:34). Furthermore, the preservation and conservation infrastructure was also deteriorating (Mazikana 1995:23). The air-conditioning systems had broken down in most archival institutions leading to deterioration of records.

Some problems facing preservationists were of a biological nature. For example, in the recent past Angola's greatest problem was how to keep collections free from insects (Antunes 1993). The preservation problems were compounded by the fact that there was "almost total absence of African research" into preservation (Mazikana 1995:26). Although, the statement was made in 1995 it still rings true of the present situation regarding research into preservation in Africa. It is evident from many research databases and library and information literature that very little research is being conducted.

Although preservation of materials seems to be recognised in developed countries, African professionals still have a long way to go before they acknowledge the role of preservation practices in their institutions (Endra 1993). At the lowest level, the cleaner must be made to understand that sweeping, cleaning and dusting records and archives storage places greatly help preservation efforts. Top management must evolve practical preservation policies and ensure that they are implemented.

More emphasis should be put on training of conservationists and preservationists at institutions of higher learning. Furthermore, as pointed out in section 2.6, the management and preservation of electronic records present specific new challenges, which need to be addressed by all those providing archive services. Additional professional training needs to be provided in this field if continued access to digital objects is to be guaranteed.

2.15.2 Access to public records and archives: a historical perspective¹²

Principles of access to archives have evolved over time. As Duchein (1983; 1990) and Segura (1990) explained, before the nineteenth century, access to archives was strictly controlled and limited. The use of archives was limited to their owners or researchers officially

2002 as well as being past member of the Curriculum (Archive) Advisory Committee of Technikon South Africa in 2000-2001.

¹² This sections draws extensively from Ngulube (2002c).

commissioned to write about historical events of the creators of records. Thus, archives existed primarily to serve the needs of their creators. The role of the archivist was to provide effective and efficient access to the records and archives by their creators.

The eighteenth and nineteenth centuries witnessed a gradual opening up of public archives to researchers and historians in European countries. The ideas of philosophers like Jean Jacques Rousseau that underscored the fact that people had the right to control those who governed them, influenced Voltaire to avow that people had the right to criticise and, therefore, the right to knowledge. The spin off of the ideas of enlightenment was the first law on archives, the Declaration of Archival Rights of 25 June 1794 passed in France. The legislation was deeply rooted in the French Revolution's concept of freedom to information. It proclaimed that the citizens would have free access to public archives (Couture & Rousseau 1987:22; Posner 1967:25-26; Segura 1990). Thus, archives ceased to primarily exist for providing evidence to their creators.

During the nineteenth century, many national archives began to open up their holdings to a wide range of users, although historians were given preferential treatment. The emergence of the concept of the right to information in the 1960's created new demands for accessibility to records and archives. The passing of Freedom to Information Acts (FIO) in most countries meant that access to information was no longer a privilege restricted to few scholars, but became a democratic right for all citizens. In a sense, records and archives had now assumed a double function, that is, one of serving the administration that produced the records as well as the public seeking information. The principle of the freedom of information is now enshrined in the constitutions of most democratic governments, including South Africa.

The general trend worldwide is towards liberalizing access to records and archives in order to foster good governance, accountability, transparency and protection of human rights. However, the majority of governments in Africa have not made significant strides in making access to information a basic right for the citizens. Save for countries like South Africa, the freedom of access to information has remained an unfulfilled dream in most African countries. The principle of freedom to information as it pertains to South Africa is discussed in section 3.3.5 of Chapter Three.

The International Council on Archives (ICA) has been concerned for a number of years with access to information contained in archives and records. Its constitution declares one of the objectives of the organisation as:

To facilitate the more frequent use of archive repositories and effective and impartial study of archival documents by making their contents more widely known and by encouraging greater ease of access to archive repositories (ICA 1985).

Concern with the problems of access is a theme that runs through the proceedings of the congresses of the ICA, which were held at three-year intervals between 1950 and 1956 (Evans 1987:55). The underlying theme of the congresses was the promotion of the scholarly use of archives. That led to the liberalisation of access to archives as many countries reduced their closed periods.

Access to records and archives are generally regarded as keys to democratic governance and accountability. According to Ketelaar (1992:5):

Archives – well preserved and accessible to the people- are as essential in a free democracy as government of the people by the people, for the people. Because archives are not only tools of the government, not only sources for historical research: access to public archives give the people the possibility to exercise their rights and to control their governments, its successes, its failures.

In other words, access to public records and archives is key to:

- accountable decision making;
- effective and efficient public participation in government affairs;
- preserving collective memory;
- people's right to access information to enable them to more fully exercise and protect all of their rights; and
- efficient research and effective administration.

Access to records and archives is largely influenced by legislation and administrative limitations. Legal frameworks that govern the definition of public archives, the right to information, copyright, the right to privacy, the protection of state and private interests largely regulate access to archives and records.

On the technical and administrative plane, manpower for archive services, the organisation of archive services and the transfer of administrative files to archive repositories, systems of arrangement and description come into play. Research has shown that public records were in a chaotic state, and records keeping systems had collapsed in many countries in Africa (Mazikana 1992). This makes public records inaccessible. In addition to poor records management systems, Africa was dogged by backlogs of accumulated records and congested records offices (Khamis 1999:54). Records stores were generally full to capacity and records were dumped without any order or rudimentary tools for retrieving them so that they would be easily accessible to users (Khamis 1999:55). However, backlogs are not peculiar to Africa. The problem was also prevalent in the UK, for example (Historical Manuscripts Commission 1999).

A study carried out by Duchein (1983) in developing countries argued that access to archives was non-existent in those countries as a result of the absence of premises, qualified staff and finding aids. Finding aids are one of the keys to accessing the information held in records and archives. In that regard, Mazikana (1999:74) observed that the biggest barrier and obstacle to accessing information contained in records and archives was not the existence of difficult access conditions and regulations limiting and preventing access, but simply the poor state in which many records were kept, the absence of systems for their proper management, improper storage and lack of finding aids to access them. The lack of finding aids ultimately affect access to information. Their absence is one of the indicators that access to records and archives is limited or not possible (Ngulube 2002c:576).

Records and archives are completely inaccessible in many countries despite the existence of legislative frameworks (Mazikana 1999:74). Efficient access to the information which users require can only be secured when the records are appropriately arranged and described. Arrangement and description of archives will help 'unlock' the contents of material hitherto uncatalogued. The primary purpose for arranging and describing archives is to establish physical, administrative and intellectual control (Gracy II 1977:19). Archives and records can be easily identified, managed, located and interpreted as a result of arrangement and description. Arrangement and description also facilitate the creation of finding aids like

descriptive inventories, calendars, item catalogues, indexes and guides, which are essential to creating intellectual access.

Intellectual access is directly linked to bibliographic access in the sense that they both lie behind the process of identifying and locating records and archives likely to contain information useful to research requirements. However, intellectual access goes beyond bibliographic access in most archival environments. In the broadest sense, bibliographic access is primarily concerned with providing information about records creators, and information about the holdings and the information they contain. On the other hand, intellectual access incorporates the facets of bibliographic access as well as providing information about the repository in the form of national directories and repository directories and publications, and providing referrals to sources outside the repository (Jo Pugh 1992:25). The major directory of archives in South Africa is the Directory of archival repositories in South Africa compiled by the National Archives and Records Service of South Africa. Perhaps, South Africa is the only country in SSA that has a relatively up-to-date directory of archives.

According to Wilson (1991:97) there are also “systemic barriers” to accessing information. They include office hours, providing services to the physically challenged, discriminative outreach programmes, language and technology. Systemic barriers can largely influence physical access and the opportunity to examine archives and records. Physical access can be facilitated by regular and sufficient hours of operation by archival repositories, providing space for consulting the records, enabling users to copy information from records, and safeguarding archives from theft or vandalism as well as from wear and tear (Jo Pugh 1992:6).

The “preservation-access” equation implies that in providing access to public records and archives there is a need to balance the interests of users in getting access to information with the need to protect records and archives to ensure their ongoing preservation. In addition, legal requirements underlying privacy, confidentiality, right to know and intellectual property, and the interests of the creators of the records should be upheld. Defining access policies and making decisions on providing access should be a result of balancing these interests. The

concept of balancing the interests of access against protection of privacy is a cornerstone of most literature on the subject (Ketelaar 1992:9).

Before summing up this Chapter, the literature review is going to turn to previous studies that have been carried out worldwide on the preservation of, and access to records and archives. Previous studies pertaining to preservation of archival materials in South Africa are dealt with separately in Chapter Three.

2.16 REVIEW OF PREVIOUS STUDIES ON PRESERVATION AND ACCESS TO RECORDS AND ARCHIVES WORLDWIDE

Some previous studies on preservation of, and access to records are dealt with in this section. The studies that are reviewed include what Walters (1998:161-164) termed major archives preservation studies carried out in the USA, and research studies carried out in other parts of the globe and Africa. The review deals with studies that were done in Africa followed by those conducted in Canada, UK and USA and concludes with studies carried out in more than one region of the world.

While this study does not claim to have been exhaustive in terms of identifying all related studies, it is evident that there is little research activity in the archival field. Pederson (1994) made the same conclusions in a study she did for the Twelfth International Congress on Archives. Pederson (1994) attributed the lack of research activity to the following reasons:

- the short period of time that the discipline has existed;
- the difficulty of access to documentation in archival science; and
- the development of applied research funded by archives themselves, to the detriment of basic research.

Perhaps, the number of previous studies on preservation of, and access to records and archives cited in this study is limited because access to documentation in archival science in South Africa was difficult as was observed by Pederson (1994). The few studies elaborated on in the following pages seem to confirm the view that very little basic research has taken place in the discipline as far as preservation and access to records and archives is concerned.

Indeed, a review of the literature reveals only small pockets of systematic research having been done in preservation management in archives. Examples of such research are five studies reported in Nigeria by Afolabi (1997:47), Arnoult (1986), Clements (1987), Conway (1991), Feather and Eden (1997), Hendriks and Kathpalia (1987), Khayundi (1995), Lowell (1986), Mbaye (1995), Matthews (1999), Seton (1984) and Trinkaus-Randall (1990). These research studies are elaborated on in the following pages.

Research is strongly related to reporting the results as the scientific method relies heavily on making advances based on what other workers in the field have previously accomplished. The method is rigorously enforced in the general acceptance and publication of research results (Institution of Electrical Engineers (IEE) 2001). The lack of research in archival preservation partly explains why there is limited reliable information about preservation in archives (Conway 1990:218; Kenney 1990:185).

The paucity of literature on the subject is more pronounced in sub Saharan Africa than in the developed world. For example, in a bibliographical survey by McIlwaine (1996) of writings relating to African archives, entries on preservation and conservation of archives make a total of 15 (0.93%) out of 1611 entries. The (general) section covering the rest of Africa accounts for six entries, and the remaining nine are equally distributed in East Africa, West Africa and Southern Africa. It is also noteworthy that a perusal of the table of contents of the Restaurator, International Journal for the Preservation of Library and Archival Material from its inception did not yield any research articles emanating from Africa with the exception of the contribution of Kufa (1998).

Most of the studies on the preservation of archives in sub Saharan Africa are based on theoretical insights, and scarcely grounded in practice or based on empirical research. For instance, Kemoni (1996) discussed the factors that have contributed to ineffective conservation of archive materials in Kenya as lack of adequate resources, lack of trained conservators, inappropriate buildings, absence of disaster control plans and preservation policy without clearly showing the variables that were taken into consideration in order to arrive at such conclusions. Similarly, Chida (1994) gave a theoretical overview of preservation management in Zimbabwe without referring to any methodological framework or underlying

assumptions to qualify the findings. Admittedly, Chida (1994) formulated the model drawing from his experience as an archivist at the National Archives of Zimbabwe. Both authors (Kemoni 1996; Chida 1994) did not pose a question or hypothesis, or collected data to answer a question or support the hypothesis.

Among the few exceptional surveys on preservation management in Africa that were based on empirical research are those of Arnoult (1986), Khayundi (1995), Mbaye (1995) and five studies reported in Nigeria by Afolabi (1997:47). Unfortunately, efforts to get the details of the studies done in Nigeria were unsuccessful. Although the other above-mentioned studies used questionnaires and interview schedules they neither posed a research question nor gave details of the methods used in the study. As will be demonstrated in Chapter Four, describing the methods used by a researcher is very important because it enables replication of the study by other researchers. It is natural that when reading a study the reader:

- wants to be assured that the sample or phenomenon under consideration is truly representative of the units of analysis;
- wants to know how the descriptive information was obtained (interview, observation, questionnaire); and
- wants to be convinced of the objectivity and validity of the measurement instruments (Meltzoff 1998:85).

Arnoult (1986) conducted a survey on the state of preservation and restoration of archives and library materials in Kenya. His survey was limited to major information institutions based in Nairobi, namely, the Kenya National Archives and Documentation Services, University of Nairobi, McMillan City Council Library and the Kenya National Library Services. He concluded that:

- there were no consistent policies on the preservation and conservation of materials;
- collections were housed in rooms with leaking roofs, insecure doors, large unprotected windows and were poorly maintained;
- most environmental factors (for example, temperature and humidity) were not controlled and monitored in the repositories and stack rooms; and
- disaster management plans were conspicuous by their absence (Arnoult 1986).

Hendriks and Kathpalia (1987) did a systems analysis study of the National Archives of Zimbabwe. The two-weeks study was aimed at examining the conservation facilities and conservation expertise and to assist in the development of a conservation programme for the National Archives of Zimbabwe. Data was gathered through scanning organisational documents, discussions with staff and observation (Hendriks & Kathpalia 1987:2). Hendriks and Kathpalia (1987) found out that on the one hand:

- no special equipment existed for continuously monitoring the temperature and relative humidity (RH) in the areas where records were stored (Hendriks & Kathpalia 1987:4);
- the conservation unit was not well equipped (Hendriks & Kathpalia 1987:4); and
- there was lack of coordination of various isolated conservation initiatives (Hendriks & Kathpalia 1987:10).

On the other hand:

- there was a well developed awareness of conservation needs among senior staff members; and
- users were provided with “excellent guidelines” for handling original documents (Hendriks & Kathpalia 1987:10)¹³.

Hendriks and Kathpalia (1987:12) recommended:

- that a hygrothermograph, which records temperature continuously on a weekly basis was more effective than using a dry and wet bulb thermometer;
- the employment of a chemist who would help in conducting tests and ensuring that conservation standards are maintained;
- that regular inspections be made for signs of infestation by insects, especially white ants;
- the technique of encapsulation be introduced;
- the technique of solvent lamination be introduced; and
- a plan for disaster preparedness be developed.

¹³ The author of this thesis joined the National Archives in 1988 a year after their mission and worked for the institution for 16 years and is not aware of the existence of such guidelines. Two of those years were directly spent taking care of matters pertaining to the preservation of, and access to records and archives.

On the other hand, Khayundi (1995) studied the rest of eastern and southern Africa excluding South Africa and Namibia. He sought information on stock, buildings, environmental control, preservation facilities, personnel, handling and budgetary provisions. He concluded that:

- most collections were not housed in purpose-built buildings;
- very few countries had environmental control systems;
- most archival institutions had preservation facilities such as a bindery, a restoration workshop and photographic laboratory;
- there is an acute shortage of trained staff in the field of preservation and conservation;
- mishandling of materials was rife;
- preservation was given a low budgetary priority;
- most countries had no policy documents spelling out preservation policies; and
- lack and unavailability of relevant literature denies staff running preservation programmes the opportunity to update their skills and knowledge (Khayundi 1995).

Some of the observations made by Arnould (1986) and Khayundi (1995) were also made by Mbaye (1995) in a study in West Africa. These empirical studies shed some light on preservation problems in Africa. The importance of empirical research cannot be overemphasised. Empirical research supports decision-making. Its absence can be detrimental to the development of organisations. According to Craig (1996:108), “our institutions are hampered in delivering their best services by not having the useful knowledge that would come from empirical and applied research”.

The present study attempts to fill a lacuna in the preservation of archives in Africa in general and South Africa in particular. The gap takes the form of a lack of data and empirical studies on preservation management in archives. Punch (2000:3) noted that although there are many types of research like, theoretical research, analytical research, conceptual-philosophical research and historical research, “empirical research is the main type of research in present day social science”. The present study focuses on empirical research.

The fact that both basic research and empirical evaluation of existing archives preservation management practices should be carried out is no longer debatable. Individuals, governments and international organisations alike have done research work on the various aspects of

preservation management. Unfortunately for the sub Saharan African preservation information base, most of this research has been confined to developed countries.

Outside Africa, other studies on the preservation of archives have been carried out in Canada (Canadian Council of Archives 1989), the United States of America (Council of State Historical Records Coordinators 1993; 1996; 1998; Lowell 1986) and United Kingdom (Feather and Eden 1997). Their research was applied rather than basic in nature. It was applied in the sense that it aimed at providing information that was immediately usable in the resolution of actual problems (Powell 1997:44). Although both types of research contribute to the existing body of knowledge within a field, basic research is concerned with theory construction and hypothesis testing (Powell 1997:42). The present study is basic in nature. Section 4.1 of Chapter Four explicates the two types of research.

In 1985 the National Association of Government Archives and Records Administrators (NAGARA) commissioned Lowell (1986) to study the state of preservation in fifty state archives in the United States of America. Forty-three state archives eventually participated in the survey. Ten state archives were selected for follow-up site visits “to study specific preservation problems and program efforts; to estimate collective resources available and needed; and to define program approaches that might begin to meet state archives preservation requirements’ (Lowell 1986:ii).

Lowell (1986) studied state archives’ budgets, full time equivalence (FTE) of staff dedicated to preservation activity, the existence of disaster plans, environmental controls, fire detection and suppression systems, security systems, storage of holdings, formats of holdings, and volume of records that had been exposed to conservation processes like encapsulation, lamination, deacidification and microfilming. Using data from a survey questionnaire and site visits Lowell (1986:7) concluded that the United States was facing “a preservation crisis” in the preservation of state archives. He recommended a coordinated nationwide preservation programme among government archives. The problems that led to the preservation crisis were identified as: limited preservation staff, budget, storage space, environmental controls, and lack of disaster contingency measures (Lowell 1986). Three studies of the Council of State Historical Records Coordinators (COSHRC) were done in 1993, 1996 and 1998 to find out the

state of preservation in state archives (COSHRC 1993; 1996; 1998). The three studies used questionnaires to collect data and exposed the similar problems and trends articulated by Lowell in 1986.

The Canadian Council of Archives carried out another similar needs assessment study (Canadian Council of Archives 1989). The purpose of the survey was to determine the state as well as the needs and priorities of Canadian archives (Canadian Council of Archives 1989). A total of 627 archival institutions were surveyed during 1986-1987. Of those institutions surveyed only 9% stated that they had the facilities and equipment to adequately conserve and restore archival textual material, while only 13% indicated that they had trained staff to properly conserve textual material (Canadian Council of Archives 1989:4). The survey report also identified and prioritised both the short- and long-term needs within Canadian archives.

The findings showed that the provincial/territorial and national priorities were quite similar. In both cases, conservation and physical facilities and equipment were ranked as the second and third highest priorities for Canadian archives just behind the top priority of arranging and describing the ever-increasing backlog of unprocessed archival holdings (Canadian Council of Archives 1989:19-20). Like Lowell (1986), the survey identified the need for additional conservation education and training opportunities and also advocated for a national conservation strategy.

Feather and Eden (1997) used the same methodology as Lowell (1986) in another study carried out in the United Kingdom (UK). The study was carried out to get “recent and detailed information” about preservation management in archives in UK archives (Feather and Eden 1997:4). The objective of their study was to analyse the existing preservation policies and practices in archives as well as obtain data on preservation policies in archives comparable with that already obtained for libraries (Feather and Eden 1997:4). The study was based on a questionnaire survey of 290 archives and records offices, visits to archives and libraries as well as interviews with archivists and conservators. The aspects of preservation covered by the study were: preservation policies and strategies, environmental control, housekeeping activities, training in the handling of archival materials (patrons and staff), security, disaster

management and access. The study revealed that in order to make better use of scarce resources preservation surveys of nationally important collections were essential.

The study concluded that there was need for a national preservation strategy because the preservation of the documentary materials could no longer be left at the mercy of individual organisations (Feather & Eden 1997:56). It is worth noting that Matthews (1990) had predicted that collaboration in preservation activities was one of the three main areas of significance for the decade ahead.

However, the study investigated the application of international and national standards in the preservation of archives and records in a limited sense. Feather and Eden (1997) were only interested in standards as they pertained to the storage and exhibition of archival documents as provided for in BS5454. For example, the question of capturing information on paper that conforms to international standards of permanent paper was totally ignored.

Equally ignored by Feather and Eden (1997) was the role of formal education in preservation management. The investigation of the level of knowledge and skills of preservation personnel in the UK was not done in spite of the fact that Matthews (1990) had argued earlier that education was one of the three main areas of significance for the decade ahead. Instead, they only looked at training as it pertained to the correct handling of archival materials (Feather & Eden 1997:136).

Conway (1991) and Matthews (1999) carried out notable individual studies on preservation management. Conway (1991) completed a quantitative investigation relating to the extent to which there is a relationship between preservation practice and the perceived availability and usefulness of information sources that recommend appropriate preservation actions. Using data from literature, on-site inspection of conservation laboratories, and a mail survey of 320 institutions that enrolled staff in basic preservation workshops offered by the Society of American Archivists he confirmed the impression of preservation experts that the number of staff of a repository and its ability to implement preservation programmes are strongly related.

The analysis also identified a relatively significant positive relationship between prevention planning activities and both renewal and prevention implementation activities. Correlation coefficients for each pair of measures were calculated to examine the strength and significance of the relationships. The correlation coefficients point toward the importance of personalized written and oral sources of information in the development of preservation implementation actions.

Matthews (1999) developed a standard method of surveying library and archive collections in order to provide reliable and comparable data on the nature and scale of the national preservation problem for the National Preservation Office and the Panel of UK Preservation Administrators. At the time of the inception of the project the application of the model was envisaged to provide information essential for the effective implementation of the management of preservation in British libraries and archives. According to Matthews (1999) such survey models are reported to be more common in the United States than elsewhere in the world. Matthews (1999) also identified standard elements to be included in the survey tool. A national database of results and its management and exploitation was recommended.

As a result of a lack of information about the preservation of library and archives materials in Massachusetts libraries and records repositories, Trinkaus-Randall (1990) carried out a survey to determine the preservation needs of public, academic and special libraries, manuscript repositories, historical societies and town clerks' offices.¹⁴ The research can be typified as applied because the aim was to find a solution to an immediate problem at the instigation of the National Endowment for the Humanities Division of Preservation and Access. The distinction between applied research on one hand and basic research on the other is made in section 4.1 of Chapter Four.

Data for the State of Massachusetts survey was collected by means of a questionnaire that was mailed to 1100 institutions (Trinkaus-Randall 1990). Nine hundred and sixty (87%)

¹⁴ An abridged version of the report was published as: Massachusetts Board of Library Commissioners (MBLC). 1992. Preserve to serve: the Massachusetts preservation agenda. Boston: MBLC.

respondents returned completed surveys. The report presented a description of the survey instrument and analysed the survey results in the following major categories:

- Facility information: brick and/or concrete were the most common materials in most buildings, 50% reported wood as the major component of their buildings and some buildings did not have any security measures in place.
- Environmental controls: 70% of the institutions could not maintain a constant climate throughout the whole year and most respondents knew very little about the effect of the environment on their collections.
- Fire protection: 93% had fire extinguishers, 60% reported having smoke detectors, 44% had heat detectors and 25% had sprinkler systems. Forty six percent of the respondents' fire detection systems were not connected to the local fire department.
- Preservation issues: preservation plans were nonexistent, 21% of the respondents use microfilm for preservation.
- Disaster preparedness: 7% had a disaster plan in place.

On the international front, ICA, IFLA and UNESCO have commissioned some studies on preservation (Clements 1987; Seton 1984). Seton (1984) surveyed private archives located in a wide variety of repositories in 28 countries in all parts of the world. The population of the study was selected member states of UNESCO. Data for the study were gathered through the use of a 30-item questionnaire sent to 65 institutions, records, offices, libraries and museums "thought to have holdings of private archives and manuscripts" (Seton 1984:1). Of the 39 institutions that responded 6 were from Africa (that is, two from Kenya and one each from Nigeria, Senegal, Zambia and Zimbabwe) (Seton 1984:1). The study concluded that archivists in developing countries face most of the problems common to their counterparts with longer archival traditions. The problems included inadequate buildings and equipment, lack of an effectively functioning national archival system, lack of trained staff, lack of funds and low morale (Seton 1984:30).

While the results are very useful, the study is silent on the research design. The justification for the choice of the units of analysis is not given. If indeed the questionnaire was sent to institutions "thought to have holdings of private archives and manuscripts", then the basis and

validity of the results is highly questionable, that is, purely from the norms of selecting subjects of analysis in social science research.

In 1986 Clements (1987) carried out an international study to assess the state of the world patrimony. Some 850 questionnaires were sent to 300 archives and 550 libraries and 417 (49%) replies were received (Clements 1987). As a follow up to the questionnaire, selected experts in preservation visited twelve countries in various parts of the world in order to refine the results of the survey and to collect more detailed information. Out of the twelve countries that were visited four were from Africa, namely, Kenya, Gabon, Sudan and Tunisia. It is not very clear why these countries were selected out of all the countries that constitute the African continent. Finally, at the end of July 1986, a further thirteen national archival and library institutions were requested by letter to supply some additional information on various topics such as research and training programmes, co-operation between libraries and archives and conservation of newspapers.

Replies were received from eight countries, namely, China, Costa Rica, Ethiopia, Indonesia, Malaysia, Mexico, Nigeria and Sierra Leone. The study concluded that most materials were housed in unsuitable buildings, environmental control and monitoring was neglected, collections in non-European countries were infested by pests, many institutions had rules of handling materials, photocopying was causing the deterioration of documents, preservation resource were lacking, there were no properly trained staff and there was a lack of information on preservation (for example, there were no guidelines and leaflets).

The sampling procedure used in the study is not fully explained. Researchers who may want to carry out a similar study would find it extremely difficult to replicate the study as a result of the absence of details of the methods used in the study. The importance of fully elaborating on the methods used in carrying out a research study is underscored in Chapter Four and is not repeated here. The survey also ignored to specifically deal with disaster preparedness, which section 2. 9 above dealt with and demonstrated that it is one of the key elements of a preservation strategy.

All the studies mentioned above have contributed a lot to the theoretical base of archival preservation. Despite their contributions little attention seems to be paid to the practice of archival preservation. As Lindsay (1999:425) rightly pointed out, at a theoretical level practitioners are agreed on effective preservation procedures but the difficulties arise in the management and realisation of those procedures. The Conference on Preservation Management in Libraries and Archives held in The Hague from 19 to 21 April 1999 was concerned about the traditional divide between theory and practice (Lindsay 1999:425).

The Conference concluded that one of the ways of getting round the problem would be to have written preservation plans as well as trained staff. More important, it recommended that the gap between theory and practice could be bridged by defining preservation policies that reflect the needs of the collections which can operate within the means of each given institutions (Lindsay 1999: 425). It would seem that developing programmes that are suitable for specific environments could bridge the gap between theory and practice.

Apparently, one size does not fit all. In a world with multiple stakeholders and multiple perspectives it becomes difficult to create preservation policies and guidelines that suit all circumstances. Institutional purposes vary, so it seems problematic to create hard and fast answers, to standardize technical choices that can scale across all institutions, all collections, and all use objectives.

Although, the preservation findings of previous studies are similar in many ways, they differ in significant ways, in terms of conclusions each of the studies reached regarding the institutional mission, the holdings, environmental factors, the users and technological constraints. It can be stated that each study had its own peculiar objectives and setting. However, the questionnaire was their main instrument of data collection.

2.17 SUMMARY

McCrary (1981) analysed priorities for preservation advocated by various organisations and professional groups and discovered that each advocated programme had much merit, but differed from the rest in the importance it assigned to the various elements in each programme. Although, there is no agreement as to what constitutes an institutional

preservation programme this chapter discussed the elements that can be used as a framework to establish and implement a preservation programme. Writers are likely to give varying emphasis on the outlined components depending on their priorities and environments.

The review of literature started by giving the purpose of literature review. The chapter went on to examine the relationship between preservation and access as well as the paradigm shift in preservation management. The chapter then turned to the nature of archival materials and the challenges to preserving them. Typically, the nature of paper, electronic records and audiovisual formats were discussed at this stage.

The components of a preservation programme, which include reformatting strategies, environmental control, disaster planning and security, preservation policies and plans, standards pertaining to preservation and raising awareness of the importance of preservation were also considered. The state of access to records and archives in Africa was outlined before looking at previous studies on preservation management. Previous studies facilitated the identification of “relevant questions” and gaps that are yet to be answered and bridged respectively. Building on the efforts of others it was realized that preservation studies relevant to specific environments are necessary in order to narrow the knowledge gap between what has been written and the actual practice on the ground.

CHAPTER THREE: PRESERVATION AND ACCESS TO PUBLIC RECORDS AND ARCHIVES IN SOUTH AFRICA

*And as imagination bodies forth
The forms of things unknown, the poet's pen
Turns them to shapes, and gives to airy nothing
A local habitation* (Foakes 1984: Act 5.1.14)

3.0 INTRODUCTION

A quotation from Shakespeare's A midsummer night's dream discussing the creative work poets engage in reveals that the key to becoming effective in many situations lie in joining ranks with the poets, whose creativity is grounded in local settings. The same approach can be used to address preservation management. As stressed in Chapter One, the effectiveness of addressing preservation challenges and the usefulness of preservation techniques, depend on understanding the context of the environment in which they are applied. The previous chapter highlighted the issues pertaining to preservation and access to records worldwide. This chapter specifically discusses these issues as they relate to South Africa in order to give them a local "form" and "habitation" or context as Shakespeare put it.

3.1 PUBLIC RECORDS AND ARCHIVES MANAGEMENT IN SOUTH AFRICA

The system of formally filing or registering documents was introduced to South Africa by the Dutch colonisation of the Cape in the seventeenth century. Consequently, the Cape Archives Repository contains the oldest archives of the country dating back to 1648.¹⁵ The prevailing political and constitutional arrangements between 1652 and 1910 meant that archival services developed separately in the Cape, Free State, Natal and Transvaal. The Act of Union in 1910 brought the archival services of these four colonies together under the jurisdiction of a Chief Archivist (Davies 1961; Olivier 1995).

The Public Archives Act No. 9 of 1922 created the Government State Archives Service under the Department of the Interior. As a result of the legacy of colonial divisions the archives

¹⁵ There is no agreement on the actual date of the oldest document at the Cape Archives Repository. The literature asserts that the oldest original document bears the date 30 December 1651, but the current research found that the oldest document dates back to 1648 (see Davies 1961).

service remained decentralized to the seat of each provincial administration with centralized control by the Chief Archivist. In terms of the Act, the Chief Archivist was to preserve archives in archives depots as well as assisting government in the management of current records.

In 1953 the Archives Act No. 22 repealed the Public Archives Act No. 9 of 1922. The Act had the effect of bringing Namibia's archival services under South African control in line with the administrative mandate that South Africa had over the then South West Africa. The Act also provided for the formation of a unit for the appraisal of public records known as the Liaison Section. In 1960, the Liaison Section formally started to give government advice on its filing systems, and it changed its name and became known as the Records Management Section. The 1962 Archives Act No.6 formalised the records management function of the State Archives Services.¹⁶ In addition, the Act changed the designation of the Chief Archivist to that of Director. With the end of the apartheid, the democratic government of South Africa introduced the National Archives Act of 1996, which repealed the 1962 Archives Act (Olivier 1995:6).

The National Archives Act of 1996 aligned public archives administration with the South African Constitution (1996) that ended the apartheid system that perpetuated the development of separate public archival services on the basis of race. During the time of apartheid, the homelands of Bophuthatswana, Ciskei, Gazankulu, KaNgwane, KwaNdebele, KwaZulu, Lebowa, QwaQwa, Transkei and Venda administered their archival services independent of central control. The fragmented approach led to the uneven development of archival services in South Africa. According to Olivier (1995:6),

The past fragmentation in systems of government unavoidably affected the nature and structural development of archival services in South Africa, and the policies that evolved out of these systems complicated service delivery at central and provincial level with varying intensity.

According to Schedule 5 of the South African Constitution (1996) and the National Archives of South Africa Act of 1996, archives are provincial competencies. As observed in section

¹⁶ The 1962 Public Archives Act also created an autonomous military archive which has remained largely independent of the National Archives and Records Service of South Africa.

1.1.3 of Chapter One there are nine provincial archives. The provinces comprise the Eastern Cape, Free State, Gauteng, KwaZulu Natal, Limpopo, Mpumalanga, North West, Northern Cape and Western Cape. The map at Appendix Two illustrates the nine provinces of South Africa. Provincial governments use the National Archives of South Africa Act as the framework for drafting their provincial archival laws. To date the provincial governments of Free State, KwaZulu Natal and Mpumalanga have passed their archival legislation (Department of Arts, Culture, Science and Technology (DACST) 2000:69).

The national archives is responsible for assisting and supporting provincial archives services as well as setting up standards and providing professional guidelines (DACST 1995:43; 1998:20). However, the National Archives and Records Service of South Africa (NARSA) has not followed up this mandate by developing a comprehensive framework for the provincialisation of archives (Dominy 1999/2000:87). Progress with the provincialisation process has been slow (Directorate State Archives and Heraldic Services 1999-2000:7).

The problem of the absence of a comprehensive provincialisation policy becomes evident in a situation where archival development varies from province to province. Current records management and archival activities are largely influenced by the archival infrastructure that was inherited by the respective provincial governments after the end of the apartheid era. Effectively, only four provinces are going to inherit archival infrastructure from NARSA (Dominy 1999/2000:87). Gauteng, Mpumalanga, Northern Cape, Limpopo and North West provinces have little or no archival infrastructure to inherit from past administrative governments of South Africa (Directorate State Archives and Heraldic Services 1999-2000:7).

Most former homelands administrations neglected the management of public records and archives (Dominy 1999/2000:87). No infrastructure was set up to deal with this important national cultural resource. For instance, Mpumalanga did not inherit any archival infrastructure from either the central government or the former homelands of KaNgwane and KwaNdebele (Dominy 1997:32). That partly explains why archival services are relatively underdeveloped in that province.

3.1.1. Mandate of the National Archives and Records Service of South Africa

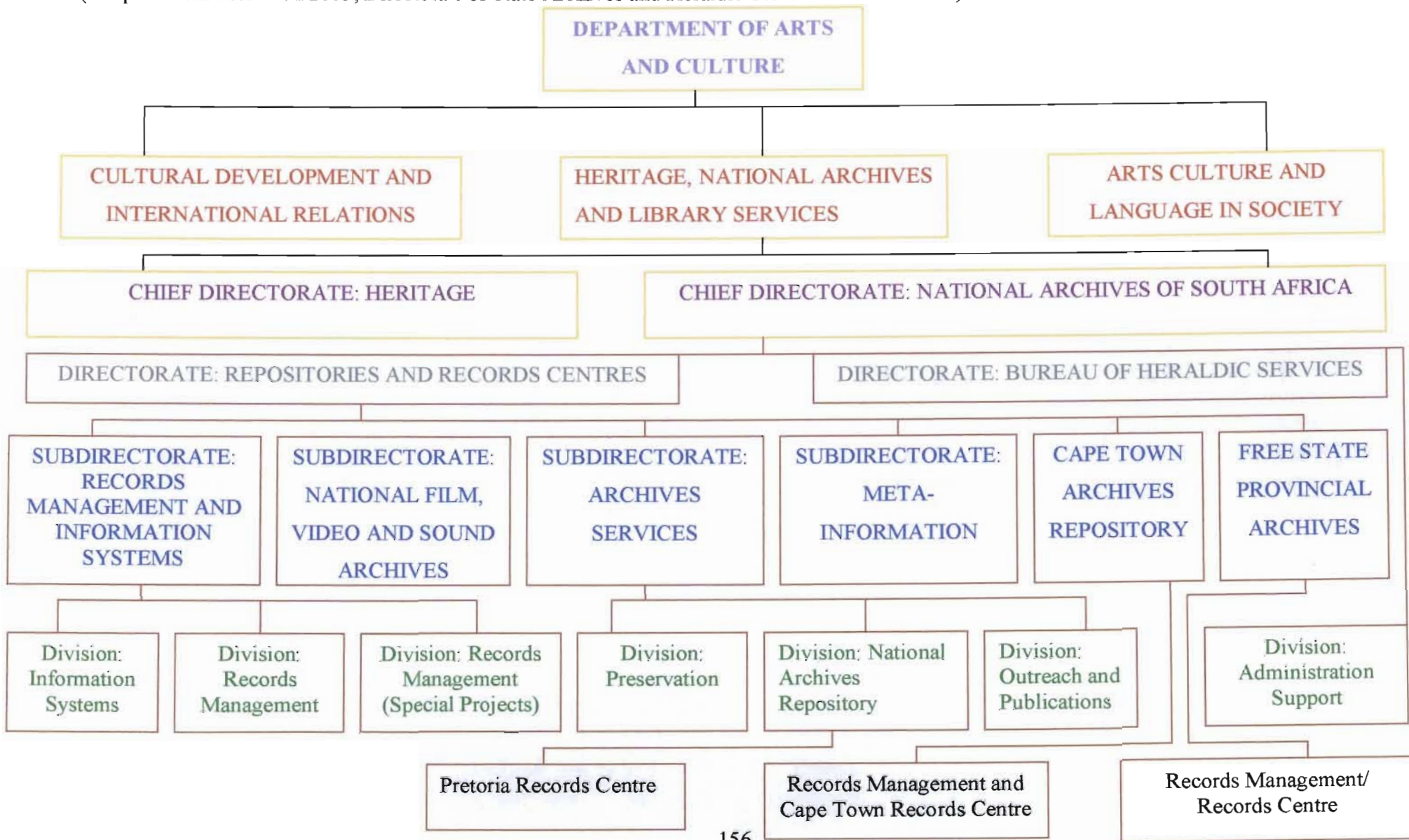
NARSA, as the keeper of public records and archives from 1651, has in its care the largest accumulation of original documents in South Africa. Among the holdings are records on nearly every known recording medium: manuscript, typewritten, and printed text on paper; printed maps; still pictures on paper, glass, and plastic film; aerial photographs; architectural and engineering drawings; motion picture film in black and white, and colour; sound recordings in nearly every medium; and machine-readable records from many electronic data processing systems. According to the preamble of the National Archives of South Africa Act, as amended, NARSA is supposed to provide for the proper management and care of public records as well as facilitating their preservation and use. It carries out its mandate through the various organizational structures outlined in Figure Three below.

Before discussing some of the major functions of NARSA, a brief discussion of the organizational structure of the National Archives and Records Service of South Africa depicted in Figure Three below is given. It should be noted that the discussion is limited to those sections directly relevant to the preservation of records and archives. Thus, this section will only give details on the archive repositories and records centres. The National Archives Repository in Pretoria keeps archives emanating from central government dating back to 1910.

On the other hand, archives from the colonial and republican period before 1910, as well as archives of provincial administrations, local authorities, magistrates and commissioners are housed in provincial archives repositories. These are the Free State Archives Repository, the Pietermaritzburg Archives Repository, the Durban Archives Repository and the Cape Town Archives Repository. The Pietermaritzburg Archives Repository, the Durban Archives Repository and Ulundi Archives Repository currently constitute the KwaZulu-Natal Provincial Archives services. The Port Elizabeth Archives Repository was an intermediate archives depot for the custody of semi-current records until the year 2000 when it was devolved to the Eastern Cape Province as well as being amalgamated with the Province's facilities in King William's Town and Umtata (Directorate State Archives and Heraldic Services 1999-2000:6). The National Film, Video and Sound Archives (NFVSA) in Pretoria is responsible for the acquisition, restoration, preservation and making available of audio-visual materials made in and about South Africa. Section 3.1.2 below is devoted to the activities of NFVSA.

Figure 3: Organisational structure of the National Archives and Records Service of South Africa

(Adapted from Anderson 2003; Directorate of State Archives and Heraldic Services 1999-2000:24)



3.1.1.1 Records management in South Africa

One of the key functions of NARSA is the management of public records at all three levels of government, that is, national, provincial and local level of government. Through the records management programme NARSA supervises every official record from the creation stage up to its ultimate disposal. In terms of section 13 (2) (b) of the National Archives of South Africa Act 1996, as amended:

No public record under the control of a government body shall be transferred to an archives repository, destroyed, erased or otherwise disposed of without the written authorisation of the National Archivist (South Africa 1996b).

The National Archives ensures that records receive adequate physical care and are arranged according to an approved classification system. Therefore, the aim of the records management programme is to facilitate efficient administration and the transfer of records of enduring value to the archives depots.

To that end, archival institutions in South Africa design and implement filing systems in government offices, appraise records, exercise control over microfilming and document imaging projects and conduct inspections to make sure that directives are adhered to. Thus, records and archives in government offices and offices of local authorities are inspected to ensure that archival instructions are complied with.

The aim of the records management programme is to promote efficiency and economy in public record-keeping. Effective records retrieval systems are facilitated by the design and implementation of records filing systems. Only registered and authorized files are maintained in current public records systems. After records appraisal (the system that is used to determine the value of records) has been carried out, the retention schedules that authorise the disposal of records are devised. Semi-current records are usually transferred to intermediate storage centres. When the time of their ultimate disposal comes, records that are not deemed to be of enduring value are destroyed while those of archival value are transferred to the archives repositories, where they are preserved for use by the state and the public.

The Records Management Division also offers a four-day course in records management to senior staff with records management responsibilities in order to impart skills on the proper management of records (Harris 2002a).

The records management function of NARSA is very important because it is key to effective records retrieval systems in government offices. In other words, the records management role of NARSA assists public offices to meet the internal and external demand for the information that they keep (Directorate State Archives and Heraldic Services 1995:6). Without an effective records management system, government offices will not be able to discharge their duties effectively. Effective public records management facilitates public accountability, an essential component of democratic society. The promulgation of the Promotion of Access to Information Act No.2 of 2000 as well as the Promotion of Administrative Justice Act No.3 of 2000 make it mandatory for governmental bodies to have proper physical and intellectual control of their records so that they fulfil their obligations regarding the protection of the citizenry's rights and the administration of justice.

Unfortunately, records surveys and inspections, which are key to monitoring and evaluating the use of approved records classification systems as well the proper care and management of public records, are conducted irregularly due to manpower constraints (Harris 1992:15; Nel 2001; Ngcoya 2002). For instance, during the periods 1998-1999 and 1999-2000 NARSA only carried out 12 routine inspections in each instance. According to the annual report of the Director of National Archives, "ideally, each of the many hundreds of governmental bodies should be inspected at least annually" (Directorate State Archives and Heraldic Services 1998-1999:10; 1999-2000:11). Without qualified staff, the maintenance of minimum professional standards in the management of records cannot be guaranteed.

The records management function is directly linked to archival appraisal. Appraisal is the process whereby archivists determine records of enduring value, and select them for transfer into archival custody, while destroying those of non-archival value. Disposal authority issued by NARSA helps government departments to transfer archival records to archival repositories and to destroy those that would have outlived their purpose. However, there is an ongoing debate about the practicality of the appraisal process (Musembi 1997:44; Ngulube 2001d). The

question of what archives to preserve is key to the future of historical research, good governance and continuity of decisions. Ultimately, archives help society to verify facts and figures. Perhaps the most important service rendered by archivists to society is the selection and preservation of archives through the process of archival appraisal. The problem stems from the fact that all records have some conceivable value. However, the cost of storing, arranging, describing, preserving and providing reference does not justify keeping everything.

The absence of an adequate framework for determining the proper disposal of records could lead to wrong records disposal actions. In essence, wrong appraisal decisions can be a barrier to access to records and archives by society. It remains to be seen whether or not the macro-appraisal¹⁷ approach that NARSA is applying would produce documentation that is representative enough not to constitute a barrier to accessing information by present and future generations.

3.1.1.2 Management of electronic records in South Africa

In recognition of the inroads that electronic records were making into public offices, the Director of State Archives issued a directive to all government offices and local authorities in 1974 bringing their attention to the fact that records generated as a result of the use of computer technology were supposed to be treated as archives in terms of the Archives Act of 1962 (Kirkwood 1994:8). The concern with managing electronic records was further encapsulated in the National Archives of South Africa Act No 43 of 1996. The National Archives Act defines “electronic records systems” and gives NARSA specific authority in relation to their management.

The National Archives Regulations, promulgated in 1997 in terms of the National Archives Act of 1996, require heads of governmental bodies to report any intention to implement an electronic records system. The reader is referred to Appendix 13 for some extracts from the Regulations.¹⁸

¹⁷ See Ngulube (2001 d) for a more detailed discussion on macro-appraisal.

¹⁸ The Cultural Act of 2001 amended the regulations, but the full text of the new regulations was not available to the public at the time of finishing the draft of the thesis.

Despite the existence of a legislative framework empowering the National Archives to facilitate the preservation of digital artefacts, electronic records management does not feature prominently in the annual reports of the Directorate of the National Archives until the early 1990s. No wonder the investigation into the preservation of electronic records was only done in the 1990s by the Committee for Machine-Readable Archives (Director of State Archives and Herald 1993:11). In 1993 the Director of Archives made a policy decision that electronic records would be accepted for permanent preservation provided adequate guidelines and facilities could be provided for their archival preservation (Director of State Archives and Herald 1993:11).

In 1995, NARSA arranged for the transfer of electronic records of the Department of Foreign Affairs into archival custody (Directorate State Archives and Heraldic Services 1995:12). A sample of electronic records of the Department of State Expenditure, reflecting the total staff establishment of the Public Service, was also taken into archival custody (Directorate State Archives and Heraldic Services 1995:12). Another snapshot of the government's personnel administration was acquired between 1999 and 2000 (Directorate State Archives and Heraldic Services 1999-2000:11).

However, NARSA has experienced problems in preserving the physical media on which the records are recorded as well as preserving the means of retrieving them (Kirkwood & Venter 1999/2000:31). In addition to that, NARSA has little expertise in the area of electronic records keeping, although electronic records are proliferating throughout government (Directorate State Archives and Heraldic Services 1999-2000:21). In an attempt to control the situation in terms of managing electronic records, NARSA issued guidelines on the management of electronic records. The major shortcoming of the guidelines is that they are not simple or modular or comprehensive or specific enough. They cannot be easily applied as procedures and processes are not clearly articulated (Ngulube 2000; 2002b:33).¹⁹

For instance, the use of unclear guidelines in the management of electronic records was once the subject of Federal Court action in the US (Anonymous 1998). The Public Citizen, the

¹⁹ It is hoped that the new guidelines that are due to be released in 2003 are going to address the anomaly

American Library Association and other interested citizens went to court to challenge a directive issued by US Archivist, John Carlin, authorizing all federal agencies to destroy electronic records if they retained a hard copy. The Archivist issued the directive without giving clear guidelines as to when federal agencies could purge records from their computers. The Archivist could have saved himself the humiliation of having his directive overturned by Judge, Paul L. Friedman, if he had made clear guidelines on the disposal of electronic records before issuing the directive.

The implementation of NARSA's electronic records programme has always been hampered by a lack of resources (Kirkwood 1994; Kirkwood & Venter 1999/2000:31). But, lack of expertise in the management of electronic records has been the major impediment. With the passing of the Promotion of Access to Information Act 2000, the National Archives cannot afford the luxury of sitting back and lamenting its lack of resources. Citizens will come forward wanting to have access to information in different formats. If they fail to get it as a result of the poor management of the records they will not take kindly to the excuse of scarce resources. The National Archives as the watchdog over records created by government bodies has an obligation to enhance access to them. That is the best way that accountability, transparency and good governance can be achieved.

However, not all is lost because NARSA is currently working in partnership with the State Information Technology Agency (SITA) to formulate guidelines for the management of electronic records. According to the State Information Technology Agency Act, No 88 of 1998 SITA is supposed to provide information technology and information systems services for government bodies in South Africa. In the long run the partnership between the two state agencies could prove beneficial to the management of electronic records in South Africa. SITA can provide the technical knowledge and skills for the management of electronic records while NARSA can provide the records management expertise.

As discussed in section 2.6 above, the key problem facing electronic records and archives with regard to preservation is that the digital surrogates themselves are subject to decay; nobody is yet quite sure of their life-expectancy. Long-term costs, whether of re-scanning the material or moving the existing digitised images to new platforms before they become unreadable, could

be prohibitive. The best prospects for preserving access to archival electronic records will be to retain those records within a technological environment:

- which can maintain accessibility to the records in question; and
- which can maintain authenticity, in conformity with the changes and developments in technology as they occur over the time.

In most cases, this environment will not be found in archival institutions, but in government agencies, which generated the records originally.

3.1.1.3 From binding to the preservation of records and archives

It is evident from the annual reports of the Directorate of the National Archives of South Africa that preservation developed from being simplistically considered as something to do with binding and restoration in the 1980s to be somewhat key to all archival activities in the 1990s.²⁰ The annual reports of the 1980s tended to concentrate on statistics relating to binding and lamination work done by the Archives Bindery in Pretoria. It was not until the end of the 1980s that the name of the restoration and binding unit of NARSA was changed from Archives Bindery to Restoration Division. Perhaps, this represented a paradigm shift in the way that the National Archives perceived conservation and restoration activities.

Despite the change in emphasis from binding to restoration, the annual reports of the archives directorate were not informative as to what activities were involved in restoration. For instance, the annual report of 1994 reported that, “conventional restoration work was continued” (Directorate of State Archives and Heraldic Services 1994:3). Such statements are not very useful to the reader who might be concerned with the actual remedial conservation work being carried out on the nation’s documentary heritage.

It is evident from the annual reports of the archives directorate that the Restoration Division mainly concerned itself with binding and laminating documents. It was argued in section

²⁰ Although the *Archives News* (the National Archives of South Africa’s quarterly staff periodical) offers some insight into restoration activities carried out at the time, the author of this thesis heavily relied on the annual reports of the Directorate of the National Archives of South Africa which were perceived to be more official and authoritative than the former. Accessibility of the sources also influenced the choice.

2.5.3.3 above that many institutions in the world gave up lamination in favour of encapsulation in the early 1970s when the Library of Congress dropped it. For instance, from 1977 to 1982, the Society of American Archivists edited and published a manual on archives and manuscript conservation and clearly expressed the principle of reversibility (Huiling 1996:218). According to the principle, any step or treatment that cannot, when necessary, be reversed, should not be adopted (Huiling 1996:218).

However, the National Archives of South Africa continued to use this unsuitable technique of restoring deteriorating documents. Perhaps, the failure of the State Archives to adapt to changing restoration methods is not surprising given that South Africa was isolated from the international archival community up to the 1990s as a result of the apartheid system. In fact, the annual report of the Directorate of State Archives and Heraldic Services (1995:31) admitted that the exclusion of South Africa from the international community “made it difficult to keep abreast of professional developments in archives”.

Resources and lack of expertise in the field of restoration and conservation has hampered preservation activities at the National Archives. The Restoration Division had to scale down its activities during 1994 because of a shortage of staff and funds. For instance, only 800 documents were restored as opposed to 20 000 in 1993 (Directorate of State Archives and Heraldic Services 1994:3). In 1995 restoration included mounting documents on cardboard and covering them with chiffon (Directorate State Archives and Heraldic Services 1995:25). Staff at archives depots used improvised means of restoration such as the partial encapsulation of damaged documents in archival polyester (Directorate State Archives and Heraldic Services 1995:25).

Restoration work has mainly focused on the physical repair, strengthening and protection of individual documents (Kirkwood 1996:24). Deacidification of documents is conspicuous by its absence. It was argued in section 2.5 of Chapter Two that deacidification is key to saving paper-based documents that are not made from acid free paper. It was also demonstrated that providing microclimates like archival boxes and encapsulation are not the answer to saving documents from deterioration from the effects of acidity.

According to the annual reports of the National Archivists covering the period 1995 to 2000, the National Archives' preservation strategy incorporated pre-archival intervention, preventive preservation, media conversion and restoration. The pre-archival intervention was implemented through the records management function discussed in section 3.1.1.1 above. However, it was also demonstrated in that section that this function is not carried out effectively due to lack of resources.

Media conversion involved the transfer or copying of records to a more durable medium. Paper records have been microfilmed at a very limited rate. For instance, the Cape Town Archives Repository has a single microfilm camera but possesses inadequate other resources to sustain a microfilming project (Directorate of State Archives and Heraldic Services 1999-2000:14). Very little is being done to copy deteriorating audiovisual formats to durable media because the National Archives cannot afford the expensive equipment (Directorate of State Archives and Heraldic Services 1999-2000:14).

Preventive preservation was achieved through custom-designed buildings with full climatic control. The reports are silent about the handling of documentary materials. Section 2.8 in Chapter Two established that physical handling by both staff and users compromises all documents. The section also demonstrated that the handling and care of archives largely depends on good housekeeping, and staff and user education.

Hitherto, the Restoration Division in Pretoria did most of the restoration work for the National Archives other than those of the former homelands. It is not clear how the restoration activities were carried out in the former homelands. However, with the provincialisation of archival services, it remains to be seen how the decentralised establishments would deal with restoration and conservation processes associated with preservation since they do not have the infrastructure or the manpower to carry out conservation activities (Directorate of State Archives and Heraldic Services 1999-2000:14).

3.1.2 The National Film, Video and Sound Archives

The National Film, Video and Sound Archives (NFVSA) is responsible for the acquisition, management, preservation and making available audio-visual resources of South Africa.

Different formats like films, sound recordings and other related materials, such as scripts, photographs, slides and posters are found at NFVSA.

The National Film Archives was established as a part of the National Film Board in 1964 in terms of Act No 73 of 1963, which was aimed at assisting in the promotion of the film industry. Initially known as the South African Film Institute (SAFI), the name was later changed to the National Film Archives (NFA). The mandate of the National Film Board was to trace, accession, restore, match, preserve and make available to the public films that were made about or in South Africa irrespective of the format (National Film, Video and Sound Archive 1996).

Although the activities of the National Film Board were phased out by order of the Cabinet of the South African Government on 31 December 1979, the National Film Archive remained functional and it was transferred to the Department of National Education's Directorate of Audio-Visual Education (National Film, Video and Sound Archive 1996).

In 1982 it was realized that the Film Archive should rather be part of the State Archives Service thus, the National Film Archive was incorporated into State Archives Service (Director of Archives and State Herald 1984:32). Its role was to “trace, obtain, restore, preserve and make available archival films” (Director of Archives and State Herald 1984:32).

In 1985 its name was changed to the National Film, Video and Sound Archives (NFVSA) to reflect the changing role of the unit (Director of Archives and State Herald 1985:3). The mandate of the unit was no longer confined to preserving films only; it was expanded to include videotapes, records, sound tracks and cassettes.

NFVSA is a sub-directorate of the National Archives of South Africa (see Figure Three), located in Pretoria. The aims of NFVSA are to:

- collect audio-visual and related material that was made in or about South Africa;
- preserve the audio-visual heritage of South Africa;
- make the audio-visual heritage accessible to all South Africans; and
- promote audio-visual material and the audio-visual industries of the country.

State generated material is transferred periodically in terms of the National Archives of South Africa Act No 43 of 1996. The film, video and sound industry, as well as private persons donate materials. Some material is purchased or exchanged. The passing of the Legal Deposit Act of 1997 made NFVSA a place of legal deposit for audiovisual materials. Unlike the apartheid era Legal Deposit Act that only provided for the legal deposit of microfilm, the current Legal Deposit Act (No 54 of 1997) specifically designates the NFVSA as a place of deposit for all audio-visual material that has been published and made available in South Africa. Section 7 of the Legal Deposit Act (No 54 of 1997) is very implicit on the duties of places of legal deposit. Places of legal deposit should receive, accession, retain, preserve and make accessible the materials they acquire. NFVSA catalogues its holdings and promotes access by the public, although there are backlogs of unprocessed materials.

NFVSA has a reading room where researchers can consult various finding aids as well as a computerized database free of charge. Material may be accessed on NFVSA premises at a fee determined by the Treasury. Bona fide students, however, can view or listen to material free of charge. The written permission of a copyright holder is required before any material may be borrowed for duplication. The NFVSA maintains a comprehensive index of films produced in South Africa.

In 1984 copying was done in film laboratories (Director of Archives and State Herald 1984:33). It is not very clear how deteriorating nitrate films were preserved. Statements such as the ones quoted below are not very revealing:

- Films are restored to prevent the nitrate material and damaged films from being ruined (Director of Archives and State Herald 1988:17); and
- The NFVSA restores films to prevent the nitrate material as well as damaged films from being ruined (Directorate of State Archives and Heraldic Services 1995:25).

What comes out clearly in subsequent reports is that NFVSA did not have adequate equipment or the capacity to preserve and restore audiovisual formats (Directorate State Archives and Heraldic Services 1998-1999:10). Some films were also irreparably damaged as a result of the breakdown and lack of maintenance of the climate control systems (Directorate State Archives and Heraldic Services 1997-1998:14).

3.1.3 Conditions of records in archives repositories

Over 50 million pages of paper-based records in the custody of NARSA were reported to be in urgent need of repair, restoration or conversion if they were to be preserved (Directorate State Archives and Heraldic Services 1995-1997:10). For instance, documents emanating from the Registrar of Deeds and Master of the Supreme Court Files at the Free State Archives repository were in a brittle condition (National Archives of South Africa 1999: 49). Some records of the Department of Home Affairs were also deteriorating. Most registers and indexes were in a fragile condition (Archives of the Department of Home Affairs 2000:vii). Birth and death records were in brittle condition. Registers of customary unions have been withdrawn from circulation because they were fragile (Archives of the Department of Home Affairs 2000:178).

Most records created by the Department of Home Affairs are fundamental to the protection of the citizens' rights. For instance, photocopying of the archives of the Department of Home Affairs is prohibited for fear that their wide circulation could compromise some of the rights of the citizenry. Birth records, for example, are key to proving one's citizenship and birthright.

The importance of birth records is underscored by the fact that they have a 100 years closure period as compared with most classes of records created by government, which are subject to a 20-year closure period. Furthermore, birth registers are not available for public consultation because of the sensitive nature of the information they contain. Records of this nature should be appropriately preserved. Withdrawing them from consultation because they are fragile will not solve the problem of their deterioration.

Instead of using section 12(3) of the National Archives Act to refuse access to records in a fragile state, archival institutions should consider instituting conservation treatments like deacidification and reformatting discussed in Chapter Two so as to save these very important records as well as making them accessible.

Another important area in caring for records is undertaking research into the restoration and conservation of records. Research is important because it facilitates the use of modern and safe techniques of remedial preservation. It is evident that very little research is being undertaken

in that area. The only research that is of note was that which the Pulp and Paper Research Group of the Council for Scientific and Industrial Research did during the late sixties and early seventies (Venter 1990:7). The results of these studies are discussed in section 3.5 of this chapter.

Lack of research into conservation processes might have been one of the factors contributing to the use of silk and starch adhesives containing aluminium sulphate at the State Archives bindery up to the 1970s. While aluminium sulphate deterred pests like silverfish and cockroaches from eating up the adhesive and causing further deterioration of archival materials, its acid content was likely to increase the rate of deterioration of the documents. As result of research a deacidified adhesive was used to bind documents from the 1970s (Venter 1990:8).

3.2 ARCHIVAL EDUCATION IN SOUTH AFRICA

The provision of archival education in South Africa is grossly inadequate (Abbot 2001:65; Kangulu 2000:35; Ngulube 2001c:156; Stabbins 1998). It was not until recently that archival studies were offered as a university qualification (Conradie 1990:7). This partly explains why Harris (1995:3) lamented an acute shortage of archivists and the “absence of full-time academic educational facilities for aspirant archivists”. For instance, the University of Natal only started offering archival courses in 1994 (Stabbins 1996:45).

When the idea of offering formal archival training was put forward in 1946 South African universities did not show any interest in taking up the challenge. As a result the State Archives Services took up the challenge and designed a curriculum for the National Diploma in Archival Science, which was approved by the Department of Education and Culture in 1950 (Hettie 1992:5). For one to qualify to sit for the National Diploma examinations the prerequisites were a Bachelor’s degree with History and three years of employment with the State Archives Services. Consequently, the State Archives Services was the only body that was training archivists in South Africa for some time (Botha 1996:33; Stabbins 1996:45).

However, in 1990 the National Diploma was transferred from the State Archives to the Technikon SA, a technical college that offers distance learning (Botha 1996:33; Conradie

1990:7; Directorate State Archives and Heraldic Services 1993:6; Stabbins 1996:45). The training that is offered by the Technikon has been criticised for being predominantly geared to archivists in the public sector. However, it must be noted that NARSA has not totally withdrawn from the training arena, as the National Archives of South Africa Act of 1996 obliges it to provide training for records managers employed in the civil service. The training is in the form of a weeklong course in records management (Kirkwood 1998:121).

Some universities are now offering modules in records and archives management in varying emphasis. A recent study demonstrated that the institutions that offer archival training at a tertiary level in South Africa are the Rand Afrikaans University, Technikon SA, the University of Natal, the University of South Africa and the University of the Witwatersrand (Ngulube 2001c:171). The study further revealed that at the time only the Technikon SA and the University of Natal offered some modules specifically addressing preservation and conservation issues in archives. Archival preservation education is underdeveloped. In fact, a more recent study by Murray (2002:vii) clearly demonstrated that “current course and module offerings at universities and Technikon teaching departments do not cover the essential preservation issues adequately”. The state of preservation education in South Africa is very lamentable considering the fact that a study by Thebridge and Matthews (2000:68) highlighted that: “the basic education of information workers needs to have at its heart a preservation ethos”.

Conservation and preservation are specialist activities that require training (Rhys-Lewis 1996:17). The limited local training opportunities can have a negative impact on the preservation of archives and records in South Africa. For instance, recent surveys carried out at the National Archives and the National Library as well as major archives and libraries in Hungary concluded that the majority of library and archive staff had a very limited and/or mostly obsolete knowledge of preservation issues and methods because of the hitherto limited opportunities to gain knowledge of preservation in the course of both professional training and continued professional education (Albrecht-Kunszeri & Kastaly 2000). In the case of South Africa, training facilities for archivists in general, and conservationists in particular are inadequate. One can only hope that some archivists have received their training from abroad and that once they have acquired the skills they impart them to all concerned through some in-

house training programmes. The merits and demerits of training abroad were discussed in section 2.12 above and they are not repeated here. A brief discussion of the merits of in-house training is given below.

Most archival institutions in South Africa rely on training their employees on the job. This fact is underscored in the annual reports of the Director of Archives and State Herald from 1984 to 1998. Although, on-the-job training is how most archivists acquire the skills of the trade the eminent American archivist James Gregory Bradsher warned against relying on such training (Bradsher 1988:14). More specifically, Bradsher (1988:14) asserted that:

Before entering their job or soon thereafter, and certainly periodically, they should receive formal training in order to acquire a working knowledge of the basic theoretical concepts and principles underlying the methodology of archives administration. Formal training will provide an appreciation of the archivist's role and functions, and reinforce the correct order of priorities among their duties.

Until recently, the Diploma in Archival Science was only a prerequisite for promotion to the rank of Chief Archivist at NARSA. This meant that only those who wished to be promoted to that rank undertook any formal training in archival management. The effects of such an approach to archival practice in South Africa are bound to be negative.

3.3 CHALLENGES TO PRESERVING AND ACCESSING RECORDS AND ARCHIVES IN SOUTH AFRICA

In 1992 Verne Harris observed that literature on access to records and archives was very sparse (Harris 1992:12). A cursory perusal of professional archival periodicals published in South Africa and elsewhere confirms the 1992 position of Verne Harris. Equally neglected was the issue of preservation management. The following subsections reveal that under the prevailing circumstances, the preservation of, and access to records and archives in South Africa cannot be guaranteed within acceptable limits because of the influence of the nature of the media that records and archives were created on, climatic conditions, technological changes and legislation.

3.3.1 Nature of paper used to create records and archives

The quality of paper lies at the root of most preservation problems as was demonstrated in section 2.5 of Chapter Two. The preservation challenge is complicated by the nature of the paper on which records are created. Records are created on paper that contain within it seeds of self-destruction. Most of the paper used to produce documents in Africa has been of poor quality. For instance, the poor quality of paper was characterised as one of the major problems facing Namibia and South Africa in the 1990s (Avafia 1993:3; Moodley 1993:4). Most acid free paper used in South Africa was imported, including materials used in restoration. It has been the general practice of most archival institutions to use untested materials that do not conform to any known national or international standards (see also, Kathpalia 1990; Recommendations 1995:171).

Until 1987 records and archives in South Africa were produced on paper that was not acid free (Westra 1987a:29). Going by the 20-year rule governing access to public archives, one could argue that all the archives and records currently open to the public are in danger of deterioration due to the effect of the acid in the paper they were created on. In the 1960s the South African State Archives was strongly advocating the manufacture of acid free paper as an answer to preservation problems (Westra 1987a:29). The impetus seems to have fizzled out as evidenced by the lack of the mention of the use of acid-free paper in the annual reports of the National Archives Directorate.

However, local paper making firms have the capacity to produce acid-free paper. South Africa boasts of four members of the Paper Manufacturers Association of South Africa (PAMSA), namely, Sappi, Mondi, Nampak and Kimberly-Clark group of companies who contributed almost 98% of the national pulp and paper production with a total of 17 pulp, paper and board mills across the country, with a few smaller producers making up the balance (Paper Manufacturers Association of South Africa 2002). The four main groups of companies mentioned above produced a comprehensive range of pulp, paper and board products to meet the bulk of local demand.

According to PAMSA (2002), South Africa was rated the twelfth largest producer of pulp and twenty-fourth largest producer of paper and board products in the world. South Africa

produced both hardwood and softwood pulp. Printing and writing papers, in line with international trends, formed the most significant segment of the fine paper industry

3.3.2 Environmental control and the management of records and archives

As was demonstrated in section 2.8 above climatic and environmental control is very important in the preservation of records and archives. Table Three below illustrates the climatic conditions experienced in selected South African towns where public records and archives repositories are situated. It is evident from Table Three that the environmental conditions in most of the towns are conducive for promoting chemical decay of records and archives. Temperature and RH of a storage area determine how rapidly or slowly organic objects would deteriorate as well as the rate of infestation by biological agents.

Using the Preservation Calculator described in section 2.8.1 of Chapter Two, the Preservation Index (PI) values presented in Table Four were calculated from the maximum RH and temperatures in the towns presented in Table Three to give an indication of the overall preservation quality of the records storage environment that potentially exists in many parts of South Africa.

Table 3: Temperature and relative humidity ranges in selected towns in South Africa

Province	Town	Average minimum temperature (T ^H)	Average maximum temperature (T ^X)	Mean hourly RH (%)
Free State	Bloemfontein	-1.5°C to 15.3°C	16.8°C to 30.8°C	46% to 69%
Western Cape	Cape Town	7.0°C to 15°C	17.8°C to 26.1°C	70% to 81%
KwaZulu-Natal	Durban	10.5°C to 21.1°C	22.6°C to 38.0°C	72% to 81%
Gauteng	Johannesburg	4.1°C to 13.9°C	16.0°C to 25.6°C	45% to 71%
North West	Kimberley	3.2°C to 17.9°C	18.8°C to 32.8°C	36% to 60%
Gauteng	Pretoria	4.5°C to 17.5°C	19.1°C to 28.6°C	45% to 65%

Adapted from South African Weather Bureau (2001a; 2001b; 2001c).

PI values expressed in units of years in Table Four show the combined effect of temperature and RH on the decay rate of vulnerable organic materials in archival holdings and give a general idea of how long it would take for them to become noticeably deteriorated, assuming that the temperature and RH did not change from the time of measurement onward.

Table 4: Sample of readings from the Preservation Calculator for selected towns in South Africa

Town	Temperature °C	Relative Humidity	Preservation Index (PI)	Natural aging rate	Days of mould germination
Bloemfontein	30.8°C (Hot)	69%(High)	8 Years	Very fast	219 days
Cape Town	26.1°C (Warm)	81% (Damp)	10 Years	Very fast	11 days
Durban	38°C (Hot)	81% (Damp)	3 Years	Very fast	12 days
Johannesburg	25.6°C (Warm)	71% (High)	13 Years	Very fast	111 days
Kimberley	32.8°C (Hot)	60% (High)	7 Years	Very fast	No risk
Pretoria	28.6°C (Warm)	65% (High)	10 Years	Very fast	No risk

In the case of Durban in Table Four, to say that the storage condition of 38°C and 81% RH has a PI of 3 years means that such materials would be expected to degrade in about 3 years if kept at 38°C and 81% RH for the whole time. However, storage conditions are rarely static. They vary with seasons and weather patterns. To take into account climatic changes, the PI values should be averaged over a long period of time if the storage environment is to be properly evaluated. Therefore, Table Four just gives a rough indication on how long the materials would last under the given storage conditions as well as showing the risk of mould growth.

As demonstrated in section 2.8.5 architecture plays an essential role in providing climatic conditions that slow down the decay of documentary materials. The next section addresses the storage of archival holdings and records in South Africa.²¹

3.3.3 Storage of public records and archives in South Africa

Many archival institutions in South Africa do not have purpose built archives. Section 2.8.5 above demonstrated that the most basic preservation requirement is structurally sound buildings built for the purpose of housing records and archives. In order to maintain the proper environment to protect archival materials it is necessary that the archives be the sole user and occupant of the building. Shared space or occupancy in multipurpose buildings causes a lot of

²¹ The discourse on archival buildings that are not reliant on artificial air conditioning were dealt with in section 2.8.1 of Chapter Two and they are not repeated here.

problems. For instance, varied requirements for environmental control, rules on smoking, eating and drinking cannot be easily enforced in areas that are not directly under the jurisdiction of the archival institution. Section 2.8.5 examined how food can attract biological agents such as rodents and cockroaches to the archival buildings.

The archives at the repositories in Cape Town, Bloemfontein, Pietermaritzburg and Pretoria are housed in custom-designed buildings. The Pietermaritzburg Archives Repository was built in 1937. The building is equipped with a temperature and RH control system. The reading room can accommodate up to 15 researchers. The Cape Town Archives repository was built in 1990, and it is equipped with climate control systems. So is the Free State Archives Repository that was built in 1996. The headquarters of NARSA is in the Pretoria building, which was completed in 1989, is fully equipped with sophisticated systems for temperature and humidity control (Kirkwood 1990). It has a reading room that can accommodate 25 researchers at any given time. Twelve of the 46 strong rooms are situated on the two floors below ground level; four strong rooms are on the ground floor and the remaining 30 on the five floors above the ground (McLennan 1990).

The advantages of building repositories underground are that the environment is very stable and it is economical in terms of space utilisation in cases where land is expensive (Duchain 1977:25; The National Archives of the Netherlands 2001:88). On the other hand, underground storerooms always suffer from humidity and mould (The National Archives of the Netherlands 2001:88; Wood Lee 1988). Nonetheless, special waterproofing can control humidity. Although, in principle, underground storage places reduce energy costs, they are very highly susceptible to flooding. In addition, “the possible dangers of electricity failures, negligible in the case of a repository above ground, are likely to be serious in an underground repository” (Duchain 1977:25).

Other archive repositories in Gauteng, Limpopo, Mpumalanga, the Eastern Cape, the Northern Cape and North West provinces did not boast of the same facilities as either the National Archives Repository in Pretoria or the Cape Town Archives Repository. They did not have custom-designed buildings. Most of them occupied rented premises that they at times shared with other organisations. The climatic control systems have experienced persistent problems

due to poor maintenance (Directorate of State Archives and Heraldic Services 1999-2000:14). The breakdown of air-conditioning and fire-prevention systems was acutely felt at the NFVSA, which functioned between 1999 and 2000 without these basic preservation appliances (Directorate of State Archives and Heraldic Services 1999-2000:27).

The availability of storage space is also fundamental to the proper storage of records. Table Five below gives an overview of the available and occupied space at archival institutions in South Africa.²²

Table 5: An overview of repository storage space at archival institutions in South Africa (O=occupied space and A= available space in linear metres)

Archival institution	1998		1999		2000	
	O	A	O	A	O	A
National Archives Repository	60443	12787	60946	13024	61335	14235
NFVSA (Pretoria)	5561	811	5555	825	5704	1083
Cape Town Archives Repository	25693	10796	27125	10955	30512	9626
Durban Archives Repository	4729	1552	4735	4755	5120	4370
Free State Archives Repository	4163	4573	4403	4313	4659	4058
Port Elizabeth Archives Repository	7539	414	7588	365	7637	316
Pietermaritzburg Archives Repository	7839	5815	8288	5366	8017	5635
Cape Town Records	6045	723	5439	966	5263	1142
Free State Records Centre	1324	1911	1303	2073	936	2440
Johannesburg Records Centre	5702	775	4929	773	4929	773
Pretoria Records Centre	14960	156	14960	156	14960	156

Source: Directorate State Archives and Heraldic Services (1997-1998:12; 1998-1999:13; 1999-2000:11).

The figures provided in Table Five show that there is an acute shortage of space being experienced by the National Archives Repository, NFVSA, Pretoria Records Centre and other archival institutions in South Africa (Directorate State Archives and Heraldic Services 1999-2000:27). The Johannesburg Records Centre closed in 2000 as result of a shortage of space. Government departments cannot transfer records to the records centres where they are likely to be kept under proper environmental conditions due to shortage of space. If archival

²² The Annual Report of Directorate State Archives and Heraldic Services for the period 2000-2001 has not yet been released and the figures for that period are excluded from Table Six.

repositories are no longer able to accept new accessions of records, departments might be forced to dump records in basements and other areas where space is available without taking into account the security and preservation of those records.

3.3.4 Information technologies and access to records and archives

Communication and information technologies now permeate every aspect of information storage and retrieval. Computer technology makes the production, transmission, manipulation, organisation, maintenance and consultation of records and archives easier and faster, but it represents a threat to their integrity, accessibility and preservation (Duranti & MacNeil 1996:46). However, the use of information and communication technologies (ICTs) can help archival institutions to promote wider access to, and greater public use of, their collections. NARSA is trying to take advantage of the digital technology's ability to overleap constraints of time and place to make information contained in records and archives widely accessible.

In order to overcome the barriers imposed by time and space on bibliographic access to information, NARSA started computerising some of the finding aids in 1974. The computerisation of finding aids at the National Archives culminated in the National Automated Archival Information Retrieval System (NAAIRS), which serves as a finding aid to assist users of archives to identify and locate archival materials that are relevant to their requirements. The maintenance of NAAIRS is a function assigned to NARSA by section 3(e) of the National Archives of South Africa Act (No 43 of 1996), which also requires all provincial archives services to participate in the national automated archival information retrieval system.

Although, NAAIRS also incorporated national registers of non-public records in the custody of a large number of repositories throughout South Africa, the majority of the archives described in the NAAIRS database were public records in the custody of the National Archives Repository and provincial archives repositories. NAAIRS only contained information about archival materials and not the actual texts of documents. Having identified relevant material, the onus is on the user to arrange for physical access to the information contained in the actual archival documents (National Archives of South Africa 2000a). There were over six million records available on the database. Public records were described as

individual archival units, like a correspondence file, whereas, the National Register of Manuscripts (NAREM) communicated information on a collection or group of papers.

The databases defined in the NAAIRS system related to the South African Genealogical Society on gravestones; the Bureau of Heraldry on heraldic representations registered; Cape Town Archives Repository; Cape Town Records Centre; Durban Archives Repository; Free State Archives Repository; National Register of Audio-Visual Material; National Register of Oral Sources; National Register of Manuscripts and Photographs; National Archives Repository (public records of central government since 1910); National Archives Repository (public records of the former Transvaal Province and its predecessors as well as of magistrates and local authorities); Pietermaritzburg Archives Repository and Port Elizabeth Archives Repository (National Archives of South Africa 2000a). Between 1998 and 1999 a total of 24 895 inquiries were made on NARSA's automated databases. The number rose to 46 041 enquiries and a total of 685 775 records description made available to the researchers between 1999 and 2000 (Directorate of State Archives and Heraldic Services 1999-2000:16).

3.3.5 Role of legislation in preservation and access to records and archives

Access to information contained in records is directly linked to justice. However, access to information in South Africa was heavily restricted during the apartheid era. Apartheid severely restricted access to information (Department of Arts, Culture, Science and Technology 1998:20). The subject of access to records and archives gained prominence with archivists after the end of apartheid. The Constitution of South Africa (1996), National Archives of South Africa Act (1996) and Promotion of Access to Information Act (2000) have now removed most of the restrictions imposed by previous legislative frameworks. Appendices 11 and 12 respectively contain extracts from the National Archives of South Africa Act of 1996 and the Promotion of Access to Information Act of 2000 pertaining to access to information contained in records.

According to Duchein (1983; 1990) any laws governing access to records and archives should:

- affirm the right of access to public archives and records, and define them in such a way that there can be no room for dispute about it; and

- specify which documents are freely available, which documents are subject to access restrictions, and what the procedures are for requesting permission to consult the documents which are not freely available.

The following discussion on the legal framework that governs access to records and archives in South Africa draws heavily upon Duchein's (1983; 1990) model presented above.

3.3.5.1 Legal framework for providing access to records and archives in South Africa

It was against the backdrop of the repressive and draconian apartheid system that deprived people of basic rights that the democratic government elected after the end of apartheid championed 'Open Democracy', which was rooted in the notion of free access to information.

The South African policy of access to information should not be viewed in isolation. For instance, at the end of the Second World War, the victorious powers made available all the records created by Adolf Hitler's Third Reich without restriction (Wagner 1970). The aim was to expose to the world the evil nature of Nazism. The laying open of German records prompted many citizens to urge governments to make available their own archives as well. Thus started the process of liberalizing access to archives and ultimately information.

The principles of freedom of access to information that are strongly entrenched in the western tradition are gradually permeating the African political and social landscape. It is in that light that Section 32 (1) of the Bill of Rights in the Constitution, 1996 enunciates that everyone has a right of access to:

- any information held by the State
- any information held by another person when that information is required for the exercise or protection of any rights

The Promotion of Access to Information Act (PAIA) No.2 of 2000 was promulgated specifically to give effect to this provision in the Constitution. Its preamble reads:

To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.

The ideals of the PAIA are shared by the National Archives Act of 1996, which also promotes public access to information and records. The aim of the two pieces of legislation was to

liberalize access to records and information. During the apartheid era the barriers of access to information were mainly legal as well as what Wilson (1991) referred to as “systemic”. Language and education were the chief systemic barriers to access. The apartheid system of education contributed to high illiteracy levels among Africans. Educating Africans who constituted the majority of the population of South Africa was deliberately given a low priority. For example, in 1976 the per capita expenditure per school student was R644 for whites, R189, 53 for Indians, R139, 62 for Coloureds and R41, 80 for Africans (Kriger 2000:149). Language also militated against access to public records by the majority of people.

Although, English and Afrikaans were the two official languages of South Africa, Afrikaans almost became the sole business language of government after the National Party took political control of South Africa in 1948. Africans who were neither proficient in English nor Afrikaans could not access information contained in government records and archives as a result of language barriers. Even before one considers the barriers that were imposed by the law, it becomes very clear that language and illiteracy deprived the majority of the South Africans equal access to information.

The following sections discuss the application of the PAIA and the National Archives Act of 1996, as amended, in the provision of access to information contained in public records and archives as well as the implications for preservation concerns.

3.3.5.1.1 Promotion of Access to Information Act 2000 and access to public records in South Africa

The concept of freedom of access to information and the concomitant legislation has been a subject of great interest to many scholars in southern Africa (Currie & Klaaren 2002; Harris & Hatang 2002; Kirkwood 2002a; Mnjama 2000). The aim of this section is not to discuss the merits and demerits of the concept of freedom of access to information or the related legislation. Rather, the focus will be on showing the impact of promoting access to information on preserving records as well as demonstrating how sound records management practices can promote access to information.

Perhaps, before looking at the impact of promoting access to information in South Africa we need to address two questions in order to put the discussion into context. Does the passing of PAIA necessarily mean that the right of public access to information is unlimited? Can the public demand any state information about anything? The conditions of access may be limited. The preamble of PAIA makes this implicit:

the right to any information held by a public or private body may be limited to the extent that the limitations are reasonable and justifiable in an open and democratic society based on human dignity, equality and freedom as contemplated in Section 36 of the Constitution.

According to Section 36 of the Constitution the limitation takes into account the nature of the right, the importance of the purpose of the limitation, the nature and extent of the limitation, the relation between the limitation and its purpose, and less restrictive means to achieve the purpose. Chapter Four of the PAIA contains grounds for the refusal of access to records. In short, access can be denied in order to:

- protect the privacy of a third party who is a natural person;
- protect commercial information of a third party;
- protect certain confidential information of a third party;
- protect the safety of individuals and protection of property;
- protect records privileged from production in legal proceedings;
- protect commercial information of private body;
- protect research information of a third party, and protection of research information of a private body;
- protect economic and financial interests of South Africa; and
- defend and maintain international relations of South Africa.

Section 12 of PAIA stipulates public bodies and officials to whom the Act does not apply. It does not apply to the Cabinet and its committees, individual members of Parliament and certain judicial officers.

On the other hand, in Section 46 and 70, there is a requirement for the mandatory disclosure of records in the public interest if the disclosure would reveal evidence of contraventions of the law; imminent and serious public safety or environmental risk and if the “public interest in the disclosure of the record clearly outweighs the harm contemplated in the provision in

question". "Public interest" is not defined in Chapter One of the Act, which is devoted to defining terms and the interpretation of the Act. The information officer of a public body will have to decide whether giving access to the records is in the "public interest" or not. Such vague formulations of concepts can impede the public's access to information. Other than being a very long piece of legislation comprising 45 pages PAIA has been criticised for being fraught with many contradictions and a lack of definitions, making it a nightmare to administer (Dominy 2002).

The responsibility of administering it rests with the Department of Justice while the Human Rights Commission is in charge of monitoring its implementation. PAIA was brought into operation on 7 March 2001, except for certain sections thereof. One of the major difficulties in implementing the Act has been lack of information about the records kept by government bodies (Harris & Hatang 2002). Exercising one's right to request records hinges on the availability of information about records in the offices of government and private organisations. Section 14(d) of the Act provides for the publication of such information. While the PAIA came into operation in March 2001, this section and section 10 were only brought into operation in February 2002. Some records protected by the Protection to Information Act of 1980 are also not easily accessible despite the operation of PAIA.

The Act has been used with limited success by the South African History Archive (SAHA) to access the apartheid-era military intelligence files (Harris & Hatang 2002; Paton 2002:30). The full impact of PAIA is still unknown and unassessed. Statistics on the use of the Act to access information are not available and the South African Human Rights Commission (SAHRC), which monitors the use of the Act, has not yet issued its first report on the implementation of the Act. According to Paton (2002:13) the legislation has had next to no effect so far. Very few requests for access to information have been made under the Act and there has been little compliance with its provisions by both the state and private organisations (Paton 2002:13). The limited number of requests can be attributed to the public's ignorance of how the Act can bring about social or political transparency, and SAHRC's lack of resources to fully enforce compliance with the Act (Research Unit for Law and Administration & SAHA 2002). There are also widespread shortcomings in PAIA compliance. However, SAHRC is beginning to develop capacity. The obvious challenge facing implementation of PAIA is the

provision of adequate resources by government for the institutionalising of the structures necessary to facilitate the implementation of the legislation as well as making the public aware of the provisions of PAIA.

Like in South Africa, the impact of freedom of information legislation elsewhere in Africa has not yet been assessed (Mnjama 2000:50). There will be need to study its impact on records management and access to information. Mnjama (2000) pointed out that studies carried out elsewhere show that there are benefits, which flow to records management as a result of freedom of information. Generally speaking, departments improve their records systems in order to comply with the provision of the legislation, which require each agency to appoint information officers as well as publishing lists, indexes and manuals of its information holdings. Section 14 of PAIA gives details of what information the manuals and indexes should contain. Appendix 12 gives extracts of some of the elements that should be considered in compiling the relevant manuals. It is important to note that the manuals are supposed to be compiled in at least three official languages. That will ensure that language will not become a significant factor in accessing information by literate South Africans.

On the other hand, freedom of access to information tends to lead to increased demand for access to records. Experience gained in the West shows that there is an initial rise in the number of records requested as a result of liberalising access (Mnjama 2000:52). Heavy use of records can compromise their survival if they are not handled with care. The probable impact of PAIA on the preservation of records is dealt with in section 3.3.5.3 below.

The Promotion of Access to Information Act must bring increased appreciation of the benefits, and indeed the cost - effectiveness, of competent records management and archive keeping, and give public bodies in particular a greater degree of pride in managing their affairs systematically. According to Procter (2002) a freedom of access to information Act:

Can only be as good as the quality of the records which are subject to its provisions. Statutory rights of access are of little use if reliable records are not created in the first place, if they cannot be found when needed, or if the arrangements for their eventual archiving or destruction is inadequate.

The effective involvement of archival institutions during the creation of records systems and the functional use of records in agencies are key to facilitating access to information contained in their records. The following section deals with how the National Archives Act of 1996 facilitates access to public records.

3.3.5.1.2 National Archives and Records Service of South Africa Act of 1996 and access to public records in South Africa

Administering access is an essential archival function. The subject of access gained prominence with archivists in South Africa only since the adoption of the Constitution of South Africa in 1996, and the passing of the National Archives of South Africa Act 1996. According to subsection 2 of section 11 of the National Archives of South Africa Act 1996, all records that have been in existence for 20 years are public archives open for public inspection subject to the provisions of any other Act of Parliament. The 20 years are calculated from the end of the year in which a particular document was created. If this open period is extended annually, the closed period should never be longer than 21 years. According to section 12(1)(b) of the National Archives Act of 1996 the National Archivist had the power to grant access to records that are less than 20 years old upon request, again subject to any other Act of Parliament.

In conformity with international norms, access to public records and archives in South Africa can be restricted on the grounds of national security, maintenance of public order, safeguarding the revenues of the state or protection of the privacy of living individuals. However, records that emanate from the so-called “offices of record” fall outside the jurisdiction of the National Archives of South Africa Act. “Offices of record” refer to offices: “Responsible for documents which require special treatment in order to ensure that the authenticity and legality of the contents cannot be questioned” (State Archives Services 1991:15). Records of the Department of Home Affairs, Master of the High Court, Registrar of Births, Marriages and Death, Registrar of Deeds and Parliament fall under that category (Harris 2000b:12; Kirkwood 2002a:5). In practice, these offices have complete autonomy in the management of their records.

However, the existence of legal authority to access information does not guarantee physical access. Access to information can be denied by virtue of the absence of means of locating the information. For that reason, it is customary to discuss legal and physical access together. The following section elaborates on how finding aids facilitate physical access to records.

3.3.5.2 Access denied: authority to obtain information is meaningless without means of locating it

According to Ketelaar (1990), in order to facilitate physical and intellectual access to archives, archival legislation should be explicit on archival functions such as:

- the arrangement and classification of archives according to accepted archival principles and methods;
- the provision of means of reference by whatever means are available and appropriate in order to facilitate access to archives and the retrieval of information in them;
- the provision of search or reference rooms in which suitable facilities are available for the inspection of archives which are lawfully open to the public, and the provision of other reference services (for dealing with postal inquiries, for example.) which are necessary;
- the provision of facilities for making copies of archives by photographic or other reprographic processes, and for selling such copies; and
- the publication of guides, texts, calendars, inventories, finding-aids and any other works suitable for publication prepared by staff of the archives or commissioned by the archives.

The aspects of archival legislation outlined by Ketelaar (1990) are fundamental to defining access policies of archival institutions. According to Jo Pugh (1992:59) access policies are key to giving adequate access to records and archives. Access policies should indicate the types of information that may be restricted and how restrictions will be applied, describe the finding aids and reference services (Jo Pugh 1992:60). The access policy models provided by Jo Pugh (1992) and Ketelaar (1990) in the foregoing paragraphs were used as a litmus test for the situation prevailing in South Africa's archival institutions. The literature, and survey instruments described in Chapter Four were used to gather information about access to records and archives in South Africa.

Every repository in South Africa has regular hours of operation (National Archives of South Africa 1999). Reading rooms are open to the public on Monday to Friday from 8 o'clock in the morning to 4 o'clock in the afternoon and during one Saturday every month. Research is free of charge. Users complete registration forms before using the materials. Although, positive identification of users enhances security of holdings, it is not consistently enforced. Policy statements on the use of materials are conspicuous by their absence. Each researcher is limited to a maximum of four items at any given time. General rules of handling materials are not provided to the researchers. Photocopying facilities are widely available. Smoking, eating, drinking and the use of ink are prohibited in most repositories.

Although, section 18(2)(e) of the National Archives Regulations of 1997 (see Appendix 13) only prohibits the use of fountain pens, some archives repositories do not allow the use of pens at all. They have even gone to the extent of providing free pencils. Pietermaritzburg Archives Repository, which has prominently posted instructions on the non-use of ink, is a good example. This is in contrast to the situation in Zimbabwe, where researchers are not provided with pencils, although the non-use of the pen-ink rule is more vigorously enforced than in many archival institutions in South Africa.

As discussed in sections 2.15.2 and emphasized by Ketelaar (1990) finding aids are key to accessing information contained in records. They help both the archivist and potential users to find information contained in records. Finding aids are a result of processing of archives in order to make them accessible. The processing activities include accessioning, arrangement, and description of archives. The net results of processing are finding aids.

The absence of finding aids or inadequately described archives and records can make them inaccessible. The archives in South Africa are described according to the principles laid down by the Director (State Archives Services 1990:v). The description does not conform to any known international standard of archival description.

ISAD (G) is a standard for describing archives that provides general guidance for the preparation of archival descriptions. The rules accomplish these purposes by identifying and defining 26 elements that may be combined to constitute the description of an archival entity.

The 26 data elements are organised into seven groups of descriptive information as follows (International Council of Archives 2000b):

- Identity Statement Area (identify the unit of description, that is, any archival entity being described).
- Context Area (the origin and custody of the unit of description).
- Content and Structure Area (the subject matter and arrangement of the unit of description).
- Condition of Access and Use Area (the availability of the unit of description).
- Allied Materials Area (materials having an important relationship to the unit of description).
- Note Area (specialized information and information that cannot be accommodated in any of the other areas may be conveyed).
- Description Control Area (how, when and by whom the archival description was prepared).

However, not all the elements outlined above are mandatory. Users are also free to add some other data elements which they utilize for the process of managing and controlling records within their repositories. The few elements of description that are considered essential for international exchange of descriptive information are identity statement and context areas (International Council of Archives 2000b).

The use of such standards will promote building archival networks within and between nations. In fact, the globalisation of the information society requires archivists to develop co-operative approaches to the management of information contained in records and archives. The development and maintenance of standard practices will ensure compatibility and transportability of information over space and time. The Interdivisional Committee for the Improvement of Finding Aids is said to be systematically addressing the need to update and upgrade the manual finding aids. The Committee was instrumental in updating and translating 53 inventories of the Free State Archives Repository (Directorate State Archives and Heraldic Services 1999-2000:13).

Backlogs of unprocessed archives can constrain access to public records and archives. Although records and archives would be physically present and access to them permitted, to all intents and purposes, the documents would be inaccessible to those who may need them because of lack of means of locating information in them, as they lie unprocessed in an archival repository. Backlogs of unprocessed archives amounted to 6 600 linear metres in 1988 (Director of Archives and State Herald 1988:5). The number had risen to 14 174 linear metres in 1994 (Directorate of State Archives and Heraldic Services 1994:5). The backlog of unprocessed archives rose to a staggering 30 000 linear metres in 1998 (Directorate State Archives and Heraldic Services 1998-1999:10). However, the volume of records without even a rudimentary finding aid was reduced to 8 877 linear metres in the year 2000 (Directorate State Archives and Heraldic Services 1999-2000:13).

NARSA also operated an inter-repository transfer of records in order to make records and archives accessible to users who are unable to consult them in their place of custody (Directorate State Archives and Heraldic Services 1999-2000:16). A total of 29 linear metres were transferred between 1998 and 1999 in pursuance of the inter-repository interlending. The number grew to 116 linear metres of records between 1999 and 2000 (Directorate State Archives and Heraldic Services 1998-1999:17; 1999-2000:16). It is important to note that moving records and archives between repositories could subject them to poor handling and harsh environmental conditions. While seeking to make archives easily accessible to the public, archival institutions should also be aware of all risks to the physical safety of records associated with inter-repository lending. Wherever records are transferred to another repository, the responsible archive must ensure that proper preservation standards are observed throughout the periods of their transfer.

It is important to remember that the practice elsewhere is that records and archives are not moved from repository to repository in order to promote access to the information they contain. For instance, the National Archives of Australia does not move records from one city to another (Ling 2002). Instead, researchers go to where the records are located. Alternatively, researchers can hire research agents to examine the records on their behalf, or they can have photocopies made and sent to them.

3.3.5.3 Legislation and preservation of records and archives in South Africa

The first responsibility of the national and provincial archives is the safe custody in suitable buildings and environmental conditions of all archives. According to Ketelaar (1990) archival legislation should provide for:

- the safe custody in suitable buildings and in suitable environmental conditions of all national and provincial archives, from whatever public or non-public source transferred, including archives in audio-visual, machine-readable and all other forms; and
- the provision of facilities for the repair and conservation of archival material of all kinds by appropriate methods.

Section 11(4) states that the “ National Archivists shall take such measures as are necessary to preserve and restore records”. Archival legislation of the provincial archives also states the preservation function in the same general terms (for example, section 6(4) of the KwaZulu-Natal Archives Act, 2000). The Act does not explicitly authorise the National Archives to provide for facilities for the repair and conservation of archival materials.

Although, PAIA is likely to lead to heavy use of records by the public it does not effectively address preservation issues. For instance, section 21 is only concerned with preserving records that have been asked for pending the finalisation of the request for access. While it is essential for an officer of a public body who would have received a request for access to a record of the body, to take the steps that are reasonably necessary to preserve the record, without deleting any information contained in it, it is important for PAIA to address the issues pertaining to the deterioration of records due to handling, environmental conditions and other factors described in section 2.8 of Chapter Two.

However, section 29(3)(b) of the Act does address some preservation concerns in passing. According to that section, access to information should be in the format preferred by the requester unless it is detrimental to the preservation of the record. It is silent about the preventative measures that should be taken into consideration when giving access in various forms before the record deteriorates. For example, poor photocopying practices can lead to the eventual deterioration of records making it difficult to make more copies of the record for future requesters.

3.3.6 Establishing standards

According to paragraph (g) of section 3 of the National Archives of South Africa Act 1996 as amended one of the functions and objectives of NARSA is to “assist, support, set standards for and provide professional guidance to provincial archives” (South Africa 1996b). Standards are important because they provide impetus in the establishment and development of archival services. According to Huskamp-Peterson (1993) the National Archives should have authority to establish standards for the preservation of records in the hands of the creating departments. For instance, they should include standards for microfilming, standards for maintenance of electronic records, standards for describing archives, standards for paper and ink, and standards for buildings. The standards should be binding on provincial archives as well.

Ideally, all processes should be informed by standards. The development of standards for record and archive repositories would provide a useful and impartial yardstick by which archival institutions can measure their archive services and building provisions. For instance, standards on archival buildings have been applied in the UK with a considerable degree of success (Historical Manuscripts Commission 1999).

3.4 PUBLIC PROGRAMMING

The major challenge faced by archival institutions in South Africa is making archival resources available to previously disadvantaged communities. Section 5(1)(c) of the National Archives of South Africa Act of 1996, as amended, specifically addresses the issue of making archives visible to all people. The archival institutions have to embark on programmes of taking the archives to the people. According to Cook (1997b:15) it's high time archivists realized that:

Archives are not a private playground where professional staff can indulge their interest in history or their desire to shape the past by rubbing shoulders only with prominent historians: it is a sacred public trust of society's memories that must be widely shared.

The archival professionals in South Africa are gradually accepting public programming as part and parcel of sound archival management and the law backs the acknowledgment. The impact of public programming activities of the archival institutions in South Africa remains to be seen. However, as Ericson (1990-91:116) pointed out, it is one thing to legitimise public

programming in archives in the law, and it is yet another to legitimise it in the minds of the archivists.

Over the years, archives have been severely criticized for their inactivity in the field of self-promotion and education. In too many cases, archivists wait for users to find their holdings. This situation must change if archives are to play a greater social role, let alone maintain their resource levels in severe economic times. Three thrusts could help them achieve this objective: image-building, awareness, and education programmes (Blais 1995; Ericson 1990-91:120).

Statistics regarding the use of archives and public records between 1997 and 2000 are presented in Table Six to shed light on the impact of the public programming activities.

Table 6: Number of reading room visitors to NARSA since the passage of the National Archives Act of 1996

Archive facility	Visitors 1998	Visitors 1999	Visitors 2000
National Archives Repository (Pretoria)	850	959	410
NFVSA (Pretoria)	213	199	477
Cape Town Archives Repository	2422	1590	2 219
Durban Archives Repository	559	610	551
Free State Archives Repository	431	584	647
Pietermaritzburg Archives Repository	1073	1160	1 138
Cape Town Records	21	31	44
Port Elizabeth Archives Repository	41	53	XXX
Johannesburg Records Centre	4	4	23
Total	5614	5190	5 509

Source: Directorate State Archives and Heraldic Services (1997-1998:12; 1998-1999:13; 1999-2000:11).²³

Increased utilisation of archives would help archivists to uncover deficiencies in important areas of archival management such as appraisal, description and preservation (Ericson 1990-91:117). Public programming should be based on knowledge of the users, enhancing the image of the archives, promoting awareness of archives and educating people about archives

²³ The statistics of 1997 are not given because the Annual Report covered a period of 3 years (1995-1997). It was felt that using the statistics would misrepresent the use patterns. Figures for 2001-2002 were not available at the time of conducting the research.

(Ericson 1990-91:120). Archivists can learn more about the users through user studies. Studies will also be needed to assess the impact of public programming activities.

3.5 PREVIOUS STUDIES ON PRESERVATION AND ACCESS TO RECORDS AND ARCHIVES IN SOUTH AFRICA

Section 2.16 reviewed previous studies on preservation of, and access to, records worldwide and demonstrated that very little research had taken place in that area. The few studies elaborated on in this section seem to confirm the view that limited basic and applied research has been conducted in the field of archival preservation. The concept of basic and applied research is dealt with in section 4.1 of the next chapter.

Venter (1979; 1973) did a series of studies on the aging of paper at the Timber Research Institute of the Council for Scientific and Industrial Research (CSIR). The studies were initiated during 1966 and were sponsored by the South African Government Archives. According to Venter (1979) the objectives of the studies were to evaluate the influence of various factors on paper deterioration and use knowledge gained to develop effective methods for the preservation of archival documents. The studies used qualitative and experimental procedures. Among other things, Venter (1973:1) concluded that:

- it would be more profitable to use permanent paper, even at a substantially higher cost, than ordinary paper;
- the main mechanism of paper deterioration was that of acid catalysed hydrolysis of cellulose;
- sulphur dioxide is absorbed by paper and results in serious physical and chemical deterioration; and
- deteriorating paper could be saved through deacidification.

Venter (1973:2) hoped that the results of his study were going to be used as a basis for the manufacture of more permanent paper and the preservation of existing documents. It remains to be seen whether or not the results of Venter's (1973) findings are going to be used for the two mentioned purposes. Bansa (1987b) conducted a study on paper conservation with special reference to library materials and concluded that the use of permanent paper was going to solve preservation problem associated with the acidity of paper.

Peters (1998) carried out another experimental study on the preservation of documentary materials in South Africa. The purpose of the study was to assess the environmental effects of temperature and high levels of humidity on the deterioration of paper as a result of chemical reactivity (Peters 1998:41-42). The study identified the basic chemical reactions involved in the process of deterioration and showed the relationship between oxidative degradation and environmental conditions.

Twentyman Jones (1982) studied the conservation of documentary materials in South Africa using a self-administered questionnaire sent to 66 members of the Association for Archivists and Manuscript Librarians (AMLIB) throughout South Africa and came to the conclusion that environmental factors such as temperature, humidity, light and air pollution were not taken seriously. Out of the 33 respondents 30% had light filters, 36% had temperature controls, 76% had fire alarms, 30% had humidity control, 33% had air filters and 34% had no restorer on their staff establishment (Twentyman Jones 1982:3-4).

Twentyman Jones (1982) wrapped up the finding by pointing out that a great deal was supposed to be done in the conservation field in South Africa. The reader is not told how many questionnaires were sent out. The size of the population that was studied was not clearly defined. We only know that 33 questionnaires were returned. As a result it might be very difficult to generalize the findings to other South African cultural heritage institutions that were not covered by the survey if the sample used was not representative of the population. This probably partly explains Westra's (1987a:26; 1987b) assertion that up until 1978, no formal national survey had been done regarding the state of published and archival materials in South Africa.

Coates (1995) carried out a survey of the preservation situation in South Africa. Although, he did not give details of how the study was carried out his conclusions were important. Coates (1995:38) concluded that there were no formal training programmes for preservation management in South Africa. Furthermore, some files in the South African Archives Services were in a "lamentable state" (Coates 1995:38). Using documentary evidence and unstructured interviews, Abbot (1999) investigated the role of the National Archives of South Africa in the management of the electronic records of central government. He concluded that the National

Archives was “adopting a reactive and overly cautious approach to the management of electronic records” (Abbott 1999:ii).

Recently, Koopman (2002) and Murray (2002) investigated access to archives in KwaZulu-Natal and preservation education in South Africa respectively. Koopman (2002) carried out a study on access and outreach activities at the archives in KwaZulu Natal Province. Koopman (2002) used questionnaires and unobtrusive observation to gather data. She concluded that access to archives was still limited to some few researchers. On the other hand, Murray (2002) researched on preservation education and training for South African library and archive professionals and students, and came to the conclusion that courses and modules currently offered in South do not adequately cover essential preservation issues. Her major tool of data collection was also a questionnaire.

3.6 SUMMARY

Essentially, this chapter aimed at contextualising theories and ideas identified in Chapter Two. The method of first developing a theoretical or conceptual framework that is subsequently given a context is called a deductive model. Chapter Two gave the framework to discuss preservation and access to records and archives in South Africa. Based on the literature it was demonstrated that challenges to the preservation of, and access to public records and archives in South Africa include climatic conditions, handling and storage, lack of expertise in preservation management due to inadequate archival education facilities, technological obsolescence, heavy use and public programming.

Studies that have been carried out in relation to preserving records and archives in South Africa were also discussed and it was realized this study is going to narrow the knowledge gap in the area of preserving public records and archives. This study moves beyond previous work or beyond what we already know because it is looked at preservation of public records and archives in South Africa during a period of archival transformation and provincialisation. One of the major challenges was to find out how preservation was being addressed, especially, in cases where inadequate archival infrastructure existed as well as to suggest ways of dealing with preservation issues in South Africa.

CHAPTER FOUR: RESEARCH METHODOLOGY

*A false balance is an abomination to the Lord,
but a just weight is a delight (Proverbs 11:1)*

4.0 INTRODUCTION

The phenomenon that the study tried to measure was outlined in the previous chapters. Chapters Two and Three provided the theories used to conceptualise and operationalise the variables to be measured. The abstract relationships that exist among the variables were also demonstrated. According to DeVellis (1991:51) the development of a measure that is suitable for a particular research question requires understanding the subtleties of the theory. The use of a “just weight” as quoted above from the “Book of Proverbs” in the Bible, largely depends on the understanding of theories related to the phenomenon under study. The previous two chapters discussed the theories related to the research question and established that preservation and access theories are still evolving. Measuring intangible phenomena derived from multiple evolving theories poses many challenges to social science researchers (DeVellis 1991:7). It is important to be mindful of measurement procedures as well as their merits and demerits.

After the definition of the research problem, which was to establish the extent to which preservation management was practised in South Africa, the exploration of existing scientific work provided very few useful insights. The next logical step was to make a decision to carry out an empirical investigation. This chapter describes, and justifies where necessary, the methods used in the present study, building upon criticism of the methods used in previous work, as outlined in Chapters Two and Three.

LIS researchers have been criticised for focusing on the findings and implications of their studies without giving details of the methods used in their studies (Heron & Schwartz 1994:85). Social scientists in other fields are also guilty of the same act of omission (Burton 2000b:427). Equally neglected by most LIS researchers are issues of reliability and internal validity (Heron & Schwartz 1994:85). Describing the methods used by a researcher is very important because it enables another researcher to replicate the study as well as ascertain the validity and reliability of the findings. This chapter typically includes sections on the

population and how it was obtained, instrumentation used, procedures employed in gathering and processing data, and statistical treatment of data.

4.1 JUSTIFICATION FOR THE PARADIGM AND METHODOLOGY

Research is a systematic way of seeking solutions to well-defined problems in order to get a greater understanding of a phenomenon (Leedy 1997:5; Mouly 1978:52; Powell 1999:2; Punch 2000:7). Research may be characterized as either basic or applied (Durrheim 1999:40; Gay 1996:8; Mouly 1978:41; Neuman 2000, 23; Powell 1999:2). Authorities are not agreed on the distinction between these two types of research. On one hand, Mouly (1978:43) argued that their differences are not clear because they are both, “oriented toward the discovery of scientific truth...” that “lead[s] to the solution of man’s problems”. On the other hand, a publication of the Library of Congress (1986:54) distinguished basic research from applied by saying that applied research “... makes use of existing knowledge, fundamental or empirical”, but the new knowledge generated by basic research “adds to general understanding of uniformities that go beyond any particular class of applications”.

However, some scholars have argued that there is no absolute distinction between basic and applied research (Hakim 1987:172). Although, Robson (1993:10) makes out a strong case that the differences between the two approaches are more in terms of emphasis, Bickman and Rog (1998:x) have demonstrated that basic research and applied research “differ in purposes, context and methods”.

The major goal of applied research is to gather information that contributes to the solution of a societal problem. Unlike applied research, basic research does not emphasize the solving of specific or real problems. Instead, the main distinguishing feature of basic research is that it is intended to generate new knowledge. This is not to underestimate the fact that although problem solving is not the goal of basic research, its findings could eventually be useful in solving a particular problem. The relationship between variables and statistical significance are fundamental to basic research, whereas both practical significance and statistical significance are important to applied research (Bickman & Rog 1998:xi).

In addition, basic research is usually researcher initiated, while applied research is generally commissioned research and thus client driven. LIS research has been generally skewed towards applied research (Busha & Harter 1980:8). The current study aimed at addressing the lack of basic research in LIS. In addition, the present study is basic research oriented because its objective was to generate new knowledge on preservation of, and access to records and archives rather than providing an immediate practical solution to access and preservation problems.

For research to culminate in the interpretation of data in order to formulate general laws as well as producing clues to verify these laws, it is essential to refer to an explicit research method. The research methodology assists in controlling the study, dictating the acquisition of data to address the research question, arranging data into logical relationships to enable analysis, and the drawing of conclusions that can contribute to the expansion of knowledge (Leedy 1997:9). This study drew upon qualitative and quantitative methods. According to Idsala (1995:45) the availability of quantitative and qualitative data on the state of documentary materials is a prerequisite for drawing up a preservation programme.

4.1.1 Qualitative-quantitative divide

Research methodologies revolve around two major approaches, namely, quantitative and qualitative (Creswell 1994:1; Leedy 1997:104; Powell 1999:3). A quantitative study measures a phenomenon using numbers in conjunction with statistical procedures to process data and summarize results (Creswell 1994:2; Locke, Silverman & Spirduso 1998:123). On the other hand, qualitative research is conducted in a natural setting and it is concerned with viewing experiences from the perspective of those involved and attempts to understand why individuals react or behave as they do (Creswell 1994:2; Glazier & Powell 1992:6).

The two given definitions highlight the differences between the two paradigms. The assumptions, purposes and methods of the two approaches also differ (Burns 2000:391; Punch 2000:45). For example, qualitative research does not search for data that will support or disprove a hypothesis. In addition, qualitative research does not rely on statistical analysis for inferences (Glazier & Powell 1992:6). According to Glesne and Peshkin (1992:7) and Gorman and Clayton (1997:28) the purpose of qualitative research is to contextualize and interpret

results using induction to derive possible explanations based on observed phenomena. On the hand, the quantitative approach generalizes and predicts findings based on the use of formal instruments such as questionnaires.

However, Bryman (1988:172) makes out a strong case that the differences between the two approaches are technical rather than epistemological. That means that in practice researchers can “mix and match” methods according to what best fits the questions under study. In other words, the differences between the two paradigms in approach and purpose do not mean that qualitative research and quantitative research are mutually exclusive. There are situations and topics in research that are “better served by a marriage of the two traditions” (Bryman 1988:173). The paradigms can be used together to demonstrate concurrent validity (Cohen, Manion & Morrison 2000:112). The use of two or more methods to study a phenomenon is called triangulation (Cohen, Manion & Morrison 2000:112; Kelly 1999:431).

Many studies advocate methodological triangulation because it bridges issues of reliability and validity (Glesne & Peshkin 1992; Hammersley 1992; Levine 2000). Although Glesne and Peshkin (1992:9) and Morse (1991:121) argued that using both qualitative and quantitative methods could contribute to a better understanding of the concepts under study, Creswell (1994:7) advised against using both paradigms in a single study because the whole exercise can be “expensive, time-consuming, and lengthy”.

In that regard, the quantitative research paradigm was used for the overall design of this study. The major attraction of the quantitative design is that it is the oldest type of research that can describe, predict and explain a research phenomenon (Locke, Silverman & Spirduso 1998:124). In addition, the quantitative paradigm has provided “a significant part of the foundation on which the social sciences have been erected” (Locke, Silverman & Spirduso 1998:124).

More specifically, quantitative methods and data analysis techniques can contribute to the understanding of preservation management in a number of respects. After considering the variables to be measured, the qualitative method was only found suitable for the preliminary inquiry. A qualitative preliminary study took the form of an exploratory survey (Oppenheim

1992:65; Powell 1997:58). It assisted in increasing familiarity with preservation management, as well as defining the population more clearly, developing instrumentation more specifically and establishing the research issues.

4.2 RESEARCH PROCEDURES

The study used the survey research strategy to assess the preservation of, and access to public records and archives in South Africa. A research strategy has been defined as the general approach taken in an inquiry (Robson 1993:40). The choice of a research strategy depends on the type of research question that the study is trying to answer (Manstead & Semin 1988:38). According to Robson (1993:40) the three main strategies are experiments, surveys and case studies. The common uses of the three research strategies are summarized in Table Seven below.

Table 7: Use of different research strategies

Strategy	Types of research question	Requires control of events	Focus on current events
Experiment	How?	Yes	Yes
	Why?		
Survey	Who?	No	Yes
	What?		
	Where?		
	How many?		
	How much?		
Case study	How?	No	Usually, but not necessarily
	Why?		

Adapted from Yin (1989:17).

For the purpose of the present study, the survey research strategy was chosen because the objective was to describe, compare, contrast, classify, analyse and interpret the implications of the findings to preserving records and archives in the country. The survey methodology used

in the study transcends a records survey that is typically used by records managers and archivists to gather:

basic information about records regarding their quantity, physical form and type, location, physical condition, storage facilities, rate of accumulation, use and similar data for the purpose of planning acquisition and disposal programmes, microfilming operations, new facilities and related archival activities (Charman 1990).

Records management surveys are primarily intended for developing disposition schedules, and they tend to gather information about individual records series (Fleckner 1977:9).

The survey strategy employed in the study should be seen in the light of a preservation survey. Preservation surveys are designed to collect data on the policies and means for collection management and storage, the suitability of the buildings as repositories of archival holdings, the temperature, RH, air quality and light levels where archival holdings are housed, the standards for the preservation of archival accumulations, the level of education of personnel who deal with preservation matters, access to records and archives, housekeeping, handling and emergency preparedness practices as well as the information that is gathered in records surveys as defined by Charman (1990).

The survey proceeded through the following stages: deciding the population (units of analysis or elements in the category of concern), designing, pretesting and distributing the questionnaire, carrying out interviews and observations, and analysing the data. Research ethics were the guiding canon in carrying out these activities. Starting with a discussion of the survey methodology, the subsections below address in much detail how each of the stages of the survey outlined above were accomplished.

4.2.1 Survey methodology

The basic idea behind survey methodology is to measure variables by asking people questions, and then to examine relationships among the variables. The survey methodology was used to answer the research question. The use of surveys as a research methodology is by no means an invention of the modern social scientist. Surveys were used extensively many years ago. The Domesday Book census of England conducted by William the Conqueror between 1085 and 1086, and the assessment of the effects of the plague in London in the seventeenth century

provide notable examples (Neuman 2000:247; Robson 1993:120; Sapsford 1999:1). Other early examples of surveys have been noted in Ancient Israel, Ancient Egypt, Europe and South Africa (Babbie & Mouton 2001:230). However, surveys owe their current significance and appeal to the social scientists and public officials of the first half of the twentieth century (Schutt 1996:266). Nowadays, survey research is widely used by social science researchers (Neuman 2000:34, 250). According to Babbie and Mouton (2001:231) survey research is very popular in South Africa.

Surveys are concerned with collecting standardized data directly from people about occurrences or incidences of events or instances in varying situations and circumstances (Kidder & Judd 1986:519; Robson 1993:49). Surveys are ways of producing “information to describe, compare, and predict attitudes, opinions, values, and behaviour based on what people say or see and what is contained in records about them and their activities” (Fink 1995:14). Surveys are characterized as either cross-sectional or longitudinal (Robson 1993:49; Schutt 1996:130).

Cross-sectional studies focus on the state of affairs in the population at just one point in time. On the other hand, longitudinal surveys are used when one intends to describe or assess change or development over time. Longitudinal designs encompass trend, cohort and panel studies. Trend studies essentially look at how concepts change over time; cohort studies are concerned with how historical periods change over time; and panel studies at how people change over time. Longitudinal studies are difficult to carry out and they demand a lot of resources and time since the same set of variables have to be studied over a period of time (Robson 1993:50). That explains why this study adopted a cross-sectional approach. The attraction of the method lies in the possibility of scanning a wide spectrum of issues in order to measure or describe any generalized features (Creswell 1994:11; Cohen, Manion & Morrison 2000:171). Generalizability refers to the extent to which research findings can be credibly applied to a wider setting than the research setting (Bickman, Rog & Hedrick 1998:34). Generalizability is a *sine qua non* for survey research. It is the foundation on which the external validity of research findings is based (Cohen, Manion & Morrison 2000:104).

Although, surveys have been criticised for failing to establish causal connections between variables (de Vaus 1996:7), the attraction of the survey method is that it has economy of design and a rapid turn around in data collection (Morrison 1993:38-40; Schutt 1996:268). Mail surveys are particularly appealing in terms of costs. Furthermore, they generate relatively accurate instruments through pretesting and revision. They also gather data that can be processed statistically. Based on survey statistics, the degree of confidence which can be placed in a set of results can be established.

Data gathering techniques for the survey included structured observations, questionnaires and unstructured interviews. The questionnaires were self-administered and they constituted the principal means of gathering information. Some selected heads of archival institutions were interviewed. Observations entailed visits to randomly selected sites in South Africa. The visits were partly meant to supplement and validate the information obtained from the questionnaires. The use of multiple tools to collect data for the present study indicates the use of triangulation as advocated by Arksey and Knight (1999:22), de Vos (1998:359) and Moore (2000:13).

Triangulation is the concept of using two or more instruments to collect data on a phenomenon under study (Arksey & Knight 1999:22; Rubin & Babbie 1997:318). The attraction of the technique is that the weaknesses of one research instrument are offset by the strengths of the others. Indeed, combinations of methods provide both breadth and depth in the results of the phenomenon being investigated (Moore 2000:16). Thus triangulation is one of the ways of strengthening confidence in research findings.

4.2.2 Population

According to Bless and Higson-Smith (2000:84), Ravichandra Rao (1983:9) and Rowley (2002:19) the population of a study refers to a set of objects whether animate or inanimate which are the focus of the research and about which the researcher wants to determine some characteristics. For example, a set of records, or an event, or institution, or people could constitute a study population. Depending on the size of the population and the purpose of the study a researcher can study the whole universe or subset of the population, which is referred to as a sample (Israel 1992). Although, it is desirable to study the whole population, at times

cost and time considerations make it impossible. Hence, a census is typically attractive for small populations. A census eliminates sampling error and provides data of all units of analysis in the population. For the purpose of the present study, the census approach was adopted because only 14 units of analysis were identified as discussed below. According to Leedy (1997:211) there is little point in sampling populations that are less than 100.

The population of the study were public archive repositories in South Africa, including the National Film, Video and Sound Archives (NFVSA). The units of analysis were the administrative units, that is, the archival repositories rather than the individual survey respondent. An administrative unit was considered to be an identifiable organisational body with the major responsibility of preserving and making records and archives available for use by clients. The fourteen units of analysis of the study were identified from the Directory of archival repositories in South Africa (National Archives of South Africa 1999). A detailed list of the population of the study is at Appendix One.

In a related study in the USA, Conway (1990:210) excluded the national archives central office in Washington D.C., because it had “vast resources and a unique mission”. However, in the present study the National Archives and Records Service of South Africa (NARSA) was included because it monitors archival activities throughout South Africa and some archival functions have not yet been fully devolved to some provinces as demonstrated in Chapter Three. In addition, national policy and “best practices” are formulated for implementation at NARSA, and a study of this nature, which among other things investigated issues pertaining to national preservation policies, was naturally bound to make NARSA one of the targets of examination.

According to a number of research methodologists, one of the safeguards against getting unreliable information is ensuring that the respondents are capable of supplying the required information with some degree of accuracy (Babbie & Mouton 2001:234; de Vaus 1996:84). The heads of the archival institutions under study or their representatives were regarded as people who were competent to respond to the questionnaire. It is evident from the responses to the last statement in the questionnaires, which required the respondents to state whether or not they could be contacted for further information to advance the purpose of this study, that in

some cases the heads of the archival institutions delegated the tasks to their subordinates. Nonetheless, questionnaires completed by the subordinates had covering letters from the heads of the archival institutions, which seems to suggest that they implicitly endorsed the responses of whomsoever they delegated the task to.

Before turning to data collection instruments, two concepts that are key to judging the relative success or failure in measuring social phenomena are briefly considered. Reliability and validity are the major technical considerations that researchers take into account when constructing and evaluating instruments of data collection (Babbie & Mouton 2001:119).

4.2.3 Reliability and validity in survey measurement

It has been argued that it is difficult to assess the quality of the data that one collects (Litwin 1995:3). However, it is possible to assess the accuracy of the survey tools used to collect data about a phenomenon. An assessment of the collected data hinges upon determining the reliability and validity of the survey instruments. In estimating reliability of a test, one would be examining its viability as a measurement device. Thus, reliability is the degree to which a test consistently measures what it sets out to measure while at the same time yielding the same results (Babbie & Mouton 2001:119; de Vaus 1996:54; Gay 1996:138; Schutt 1996:99). On the other hand, Gay (1996:137) defined validity as the degree to which a test measured what it is supposed to measure. The concepts of validity and reliability that were introduced in this section are also elaborated on in sections 4.2.4 to 4.2.8.

Reliability is a necessary precondition of validity (Cohen, Manion & Morrison 2000:105; Neuman 2000:171; Schutt 1996:100). On the other hand, measurement validity is a necessary foundation for social research. As pointed out above, validity is concerned with what a survey tool measures and its appropriateness, whereas reliability refers to the consistency with which the research instrument measures whatever it measures. The four common methods of testing validity are: content validation, criterion-related validation, face validity and construction validation (Bernard 2000:49; Bless & Higson-Smith 2000:131-3; Neuman 2000:169-171).

Content validation tests the relevance of the content of the test to the characteristic being measured (Bernard 2000:50). Pretesting the questionnaire was used as a tool for content

validation. Content validity was also achieved by making sure that questions were related to the problem of preservation of, and access to public archives. All the possible aspects of preservation and access were covered. Construct validity was achieved by linking the items in the measuring instruments to the theoretical components of the research topic covered in the previous chapters. The conceptualised items in the measuring instruments can be generalized to broader constructs of related concepts (see Bless & Higson-Smith 2000:131-133).

Criterion validity has been defined as, “a measure of how well one instrument stacks up against another instrument” (Litwin 1995:37). Criterion validity was achieved by comparing the instruments of measurement to those published in the literature. Questionnaires were compared with those used by Conway (1991), Feather and Eden (1997), Trinkaus-Randall (1990) as well as the preservation checklists outlined by Swartzburg (1995:33-40).

Face validity is difficult to gauge because it depends on the way the instrument of measurement is perceived. However, “on the face of it”, the questionnaire seems to have face validity because questions refer to preservation of, and access to public archives, which were the central concerns of the survey.

According to Burns (2000: 417) reliability of a research tool depends on how other researchers can replicate the steps of the original research and have similar conclusions. Repeating a study in different settings or with different subjects is called replication (Locke, Silverman & Spirduso 1998:49). In fact, research findings are considered to be reliable if they are repeatable, to the extent that repeated measurement would yield constant results (Burns 2000:6; Cohen, Manion & Morrison 2000:117; Powell 1997:37; Sapsford 1999:15).

LeCompte and Preissle (1993:332) suggest that replication is the main tenet of quantitative research. The assumption of this assertion is that in a quantitative approach, instrumentation, data and findings are controllable, predictable, consistent and replicable. While it is not debatable that, all measurement is imperfect, a measurement is generally considered to be reliable if it is consistent and accurate in its collection of data (Litwin 1995:5; Powell 1997:41).

In order to get consistent answers to consistent questions, questionnaires and observation schedules were designed to collect the data for the survey. In that regard, Sapsford (1999:5) observed that standardization lies at the heart of survey research. A standardized procedure promised the best results because it would produce information that could be compared most easily.

4.2.4 Questionnaires

Questionnaire surveys are the most commonly used research method in library and information work and can be a rich and reliable source of research data (Slater 1990:75). For instance, Alegbeleye (1988), Coates (2000), Clements (1987), Conway (1991), Council of State Historical Records Coordinators (1993; 1996; 1998), Feather and Eden (1997), Khayundi (1995), Lowell (1985), Mazikana (1995), Mbaye (1995) and Trinkaus-Randall (1990) used questionnaires to collect data on the state of the preservation of documentary materials. Most of these studies were discussed in section 2.16 of Chapter Two and the reader is referred to that section for more details.

However, the term “questionnaire” has not been uniformly used in social science research (Oppenheim 1992:100; Saunders, Lewis & Thornhill 2000:278). Some researchers use it to solely refer to self-administered and postal questionnaires, whereas others use it to refer to interview schedules as well (de Vaus 1996:80; Saunders, Lewis & Thornhill 2000:278; Schutt 1996:272). It is also important to bear in mind that typical questionnaires have statements and questions (Babbie & Mouton 2001:233). As Babbie and Mouton (2001:233) stated, the use of statements and questions gives researchers more flexibility in the design of measuring instruments. For instance, one can easily incorporate multiple-choice items and rating scales, which are discussed in greater detail in section 4.2.4.1.1 below. In the current study the term questionnaire is used to refer to a technique of data collection in which each respondent is asked to give answers to the same set of questions and statements in a predetermined order in the absence of the researcher.

The advantages and disadvantages of questionnaires are well documented in the literature (Babbie & Mouton 2001:262; Bernard 2000:231; Bless & Higson-Smith 2000:109; Mangione 1998:399; Oppenheim 1992:102; Powell 1997:91; Robson 1993:126; Sarantakos 1994:159).

Some of them are now discussed. According to Robson (1993:126), by presenting all respondents with the same standardized questions a high reliability of response can be achieved. In that sense, they provide a “stable and consistent and uniform measure without variation” (Sarantakos 1994:159). Although, on the other hand, they have limitations such as low response rates, reporting errors, completion of the questionnaire by the wrong person, and lack of control over how respondents interpret questions or opportunity to probe or correct misunderstandings, questionnaires have remained the most popular instrument for data collection in social research (Bernard 2000:233; Oppenheim 1992:102). As Peterson and Kerin (1981:5) observed nearly two decades ago, most of what is known about human behaviour stems from research questions posed in questionnaires.

The questionnaire technique was chosen as the most appropriate tool for data collection as the study covered a geographical dispersed population (Slater 1990:62). Furthermore, questionnaires can give “worthwhile insight to the conservation needs of national archives” (The National Archives of the Netherlands *et al.* 2001:52). As demonstrated in Chapters Two and Three, most surveys on the preservation of the documentary heritage have been conducted using the questionnaire as a data collection instrument. Self-administered questionnaires also permit the respondents to consult with other persons and records before responding. This is of great advantage where statistical and numerical data about an institution are required (Sudman & Bradburn 1983:264). Indeed, some items in the questionnaires required some statistical data, for example, Question Eight at Appendix Five. Thus, questionnaires give privacy in responding as well as affording the respondents the opportunity or time to look up information in cases where they are not sure of the answers (Sarantakos 1994:159).

The major attraction of the questionnaire, when compared with other data collection tools, is that it is relatively inexpensive and it allows a large number of respondents to be surveyed in a relatively short period even if the respondents are widely distributed geographically (Burns 2000:581; Cohen, Manion & Morrison 2000:129; Mangione 1998:399; Powell 1997:91). In addition, questionnaires allow respondents to answer questions at times that are convenient to them. It has been suggested that a good questionnaire should be well designed in order to produce reliable measures of the variables (Fowler 1998:344). The quality of the design of the

questionnaire can be enhanced through pre-survey evaluations or pretests. The next sections elaborate on questionnaire design and evaluation.

4.2.4.1 Design of the questionnaires, length and layout

Two questionnaires were designed to collect data on the variables to answer the research question. As pointed out, in section 4.2.2 one questionnaire was for archival institutions that predominantly preserved other records formats other than audiovisual materials, and the other was for the National Film, Video and Sound Archives (NFVSA) although the respondent did not return the latter.

When Sudman and Bradburn (1974) analysed the sources of error in surveys, they concluded that perhaps the major source of error in survey methodologies was the design of the survey questionnaire. Questionnaires were designed to achieve three related goals:

- to maximize the relevance and accuracy of data collected;
- to maximize the participation and cooperation of the target respondents; and
- to facilitate the collection and analysis of the data (Cox 1979:24).

The design of the questionnaire was based on some suggestions in the literature (Burns 2000, 580; Cohen, Manion & Morrison 2000:248-250; Fowler 1998:365-366; Kothari 1990:125; Powell 1997:92-93). Specifically, the major tools used for developing the questionnaires found in the literature are unstructured individual interviewing, qualitative group interviews, observation and scanning the literature for questionnaires used in similar studies.

Unstructured individual interviewing involved the discussion of the proposed survey topics between an individual member of the group to be surveyed and the questionnaire designer. This technique was used primarily to gain insights into the best way to structure the questionnaire. Qualitative group interviews were not used in the design of the questionnaires because it was not easy to bring together the participants to facilitate the discussion. Information obtained through observation and individual interviews was used to ensure that the content of the questionnaire would provide enough information to satisfy the survey's objectives and to help phrase questions that could be understood by the respondents. Scanning

the literature for questionnaires that have been used by others is important, as it not always necessary to reinvent the wheel, particularly if the purposes of the surveys are the same.

The questionnaire for collecting data from archival institutions other than the NFVSA was mainly informed by the questionnaires used by Hedstrom and Montgomery (1998), and Clements (1987) in surveys they conducted in the preservation of records in predominantly digital and paper-based environments respectively. The section of the questionnaires on access to records and archives drew upon Archives New Zealand's checklist of minimum requirements for providing access to records and archives (Archives New Zealand 2001). Modifications were made to the content to suit the subject area and the objective of the study.

The designed questionnaires were compared with instruments used in similar studies carried out by Conway (1991), Feather and Eden (1997) and Trinkaus-Randall (1990) in order to ensure content validity. In addition, the preservation checklists outlined by Swartzburg (1995:33-40) were also used to determine the content validity of the questionnaire. Content validity refers to the degree of fairness and comprehensiveness of the instrument in covering the issues related to research problem (Cohen, Manion & Morrison 2000:109). The need to strike a balance between being encyclopaedic and the length of the questionnaire meant that only the main elements of the research question were covered. In addition, the use of documented questionnaire design methodologies as well as tested questionnaires ensured that the questionnaires were clear in their purpose, exhaustive in their elements of inclusion, asked the most appropriate questions to elicit data to answer the research question, and asked for empirical data.

There are several kinds of items generally used in the construction of questionnaires to choose from (Babbie & Mouton 2001:233; Burns 2000:571; Cohen, Manion & Morrison 2000:248). They are characterized as closed questions and open-ended questions. Both categories of questions were used to address the research question and they are discussed presently.

4.2.4.1.1 Closed questions

Closed items give the respondent the chance of choosing from two or more fixed alternatives. The major attraction of closed questions is that they are easy to code and do not discriminate

unduly on the basis of how articulate the respondents are (Wilson & McLean 1994:21). The major disadvantage of closed-ended items is that they can create artificial forced choices and rule out unexpected responses. In order to include all the possible responses that might be expected, closed-ended items had some open-ended options such as: “other, please specify”. According to Rea and Parker (1997:34), the use of this alternative “represents an excellent compromise between closed- and open-ended response formats in that it is an open-ended question within a closed-ended format...” The two caution that the option should be used sparingly. Hence, the “other, please specify” option was only used in about 15% of the closed-ended items used to collect data for the study. Despite the fact that closed-ended items are likely to limit the possibility of including all expected response categories, the main reason for their continued popularity lies in providing greater uniformity of responses (Babbie 1995:148). Furthermore, open-ended responses do not lend themselves to easy numerical analysis in the same way that closed items do.

Closed items have three categories, namely, dichotomous questions, multiple-choice questions and rating scales (Cohen, Manion & Morrison 2000:248). The three categories are presently discussed. First, dichotomous questions required a “yes or no” response. Second, multiple-choice questions comprised of a range of non-overlapping and mutually exclusive statements or items that respondents chose their answers from. Questions 19 and 138 at Appendix Five are good example of multiple-choice items. Dichotomous and multiple-choice items facilitated the collection of nominal and ordinal data that could be processed using descriptive statistics discussed in section 4.2.10.

Third, scale items require the respondents to indicate their preferences, and degrees of disagreement or agreement with a certain attribute that is being measured. Burton (2000a:338) argued that using scaling techniques in questionnaire design is a skill, which definitely needs to be acquired. Using rating scales can reduce idiosyncratic variation in question-based measures (Schutt 1996:82). Idiosyncratic variation occurs when respondents interpret questions differently due to their reaction to particular ideas or words in the questions. The use of rating scales has the effect of averaging out responses to a question, “so that the main influence on the combined measure will be the concept that all the questions focus on” (Schutt

1996:82). In other words, the researcher is able to summate values of several variables into one score with a relatively high degree of reliability.

Examples of rating scales used by social science researchers are Likert scales, semantic differential scales, Thurstone scales and Guttman scaling (Gay 1996:126-127; Rubin & Babbie 1997:212-213; Sarantakos 1994:82). These scaling techniques were developed a long time ago and classic texts on tests and scaling such as DeVellis (1991), Guilford (1936), Nunnally (1978) and Torgerson (1958) remain excellent resources.

The Guttman scale can only be effectively used when examining the actual research data. The Guttman scale is used mostly to measure social distance. Its construction is complicated and time consuming (Sarantakos 1994:86). Questionnaire items cannot form a Guttman scale (Babbie & Mouton 2001:158). In fact, it is technically wrong to construct questionnaires on the assumption of Guttman scaling. Like the Guttman scale, the Thurstone scale is not widely used in research nowadays, mainly because it is expensive to administer (Babbie & Mouton 2001:153; Oppenheim 1992:195; Rubin & Babbie 1997:212; Sarantakos 1994:83). According to DeVellis (1991:63) Thurstone and Guttman scales have their place, but their applicability seems rather limited.

On the other hand, semantic differential scales are difficult to construct because one must first select a series of adjectives that might be used to describe a variable. The problem is selecting the words and attributes relevant and important to the respondents. In that regard, Alreck and Settle (1995:130) concluded that: "the requirement for bipolar adjectives presents a serious limitation to the use of the semantic differential".

Rensis Likert has greatly formalized the procedure for attitude scaling through the creation of the Likert scale, a format in which respondents are asked to strongly agree, agree, disagree, or strongly disagree, or perhaps strongly approve, approve, and so forth. Contrary to the assertion by Babbie and Mouton (2001:154), the Likert scale is the widely used attitude scaling technique (Alreck & Settle 1995:117; Bernard 2000:294; Churchill 1992:339; DeVellis 1991:68; Litwin 1995:49; Neuman 2000:182; Oppenheim 1992:195; Peterson 2000:75; Rubin & Babbie 1997:212 & 226; Sarantakos 1994:84). Furthermore, the scale is flexible,

economical and easy to compose (Alreck & Settle 1995:117; Sarantakos 1994:83). The Likert scale yields data that is suitable for both indexing and scaling.

The question that has remained unresolved is that of the number of response categories the scale should have. DeVellis (1991:66) asserted that the number depends on the purpose of the research and the questions asked. Neuman (2000:182) argued that Likert scales need a minimum of two categories. Sarantakos (1998:98) advocated five-answer response categories. Burton (2000a:339) recommended an odd number that accommodated neutral attitudes or fence sitters. Broadly speaking, the literature suggests that the statements should be on a five or seven point range (Kothari 1990:105). A larger number of statements or categories can confuse respondents. Nunnally (1978) cautioned against the use of a large number of categories when using the Likert scales:

As the number of scale steps is increased from 2 up through 20, the increase in reliability is very rapid at first. It tends to level off at about 7, and after about 11 steps, there is little gain in reliability from increasing the number of steps (Nunnally 1978:521).

After examining the array of types of rating scales available to researchers and the potential pitfalls of each it was decided to use the Likert scaling technique to measure the attitudes of the respondents towards preservation issues pertaining to the management of public records and archives in South Africa. The scores of the respondents were summed up to measure the respondents' attitudes towards a certain attribute. A typical example of Likert scale items is Question 163 at Appendix Five.

4.2.4.1.2 Open-ended questions

Open-ended items provide a frame for the respondent to answer without any restrictions. In other words they allow the respondents to write and explain their responses without being limited by preset categories of responses. Their inclusion in any questionnaire is very critical because they cater for any lack of exhaustiveness and bias that might be in the closed questions (Oppenheim 1992:115). However, open-ended questions were used sparingly because their responses are difficult to code (Salant & Dillman 1994:80). In fact, Robson (1993:243) discouraged their use. It is difficult to make comparisons between respondents in open-ended items. The coding process often requires that the researcher interprets the meaning

of responses. The possibility of misunderstanding the responses and researcher bias cannot be totally ruled out. There is also a danger of getting answers that are essentially irrelevant to the researcher's objectives (Babbie 1998:148).

4.2.4.1.3 Length of questionnaires

Scholars are not agreed on the length of survey questionnaires (Mangione 1998:413). For instance, Mangione (1998:413) argued that the questionnaire should be "modest in length" without elaborating. However, it is generally believed that a shorter questionnaire is likely to yield a better response than a longer one (Dillman 1978). It has been suggested that questionnaires should not be more than 10 pages and that the number of questions should not be more than 125 (Bernard 2000:252; Dillman 1978). However, the major contentious question has to do with how questionnaire length is measured. For example, are fifty questions on five pages shorter than the same fifty questions on twenty pages? Research on this issue has not produced conclusive results either (Mangione 1998:413). Neuman (2000:264) is of the view that there is no absolute proper length for a questionnaire. Hence, "[i]t is unnecessary and unrealistic to set an arbitrary limit to the length of a questionnaire" (Sudman & Bradburn 1983:226).

Some scholars have criticized the concept of designing a brief questionnaire based on the belief that respondents prefer brevity. In that regard, DeVellis (1991:11) argued that:

A reliable questionnaire that is completed by half the respondents yields more information than an unreliable questionnaire, completed by all respondents, but so prone to errors as to be interpretable. If you cannot determine what the data mean, the amount of information collected is irrelevant.

Questionnaires should not be short for the sake of achieving brevity. According to Mangione (1998:413), the most important thing to bear in mind in deciding the length of a questionnaire is to make sure that it "efficiently asks about all the elements that are important to the study". The questionnaires used in the study were very long. They had between 218 and 259 items that need to be responded to. The study sought to look at the major aspects of preservation of, and access to public and records in South Africa. The questionnaires tended to be encyclopaedic in order to get a full picture of the phenomenon under study.

During pretesting the questionnaires, all the respondents pointed out that the questionnaires were too long. One respondent had this to say:

Your questionnaire is definitely too long. It took me more than two hours to complete. Questionnaire length is one of the strongest contributing factors to non-response to mail questionnaires unless respondents are very educated or strongly motivated.

The literature supports the observation made by the respondent. According to Sudman and Bradburn (1983:227):

Since social interaction is missing, however, mail questionnaire are directly affected by length. On highly salient topics and with well-educated respondents, questionnaires of twelve to sixteen pages are possible without serious loss of cooperation.

In the same vein, de Vaus (1996:109) asserted:

The optimal length of the questionnaire will depend on the nature of the sample and the topic under investigation: the more specialised the population and the more relevant the topic, the longer the questionnaire can be.

The majority of the respondents to the pretest questionnaires pointed out that while the questionnaires were too long, they covered all the important issues. In addition, they asserted that it was well structured and easy to complete. The researcher appreciated the fact that it was going to take some time to complete the questionnaires, but the desire to be as comprehensive as possible dictated the length of the final products at appendices Seven and Nine.

The population of the survey was relatively homogenous and specialized. According to De Vaus (1996:109) such populations tend not to bother about the length of questionnaires. In fact, that point was confirmed by some of the respondents to the main survey who did not seem to mind the length of the questionnaire and felt that the information sought was very important. The Head of Archival Services in the Northern Cape Province remarked in the covering letter to the completed questionnaire thus:

Thank you very much for considering us to take part in this research survey. It was a great honour and pleasure for us to take part in the process of gathering information that deals directly with our core function (Tshirado 2002).²⁴

²⁴ Mr N. M. Tshirado, Head Archival Services, gave the author of the thesis full permission to quote from his letter unconditionally.

4.2.4.1.4 Layout of questionnaires

The appearance and layout of the questionnaire are very important considerations where the respondent completes the questionnaire. The font typeface was large and clear enough so that there was no strain in reading. Questionnaires had basic instructions on completing them at the beginning. In addition, some questions had individual instructions to facilitate proper answering. Definitions of technical terms were also provided to increase consistency of the results. The questionnaire was divided into sub-sections based on the research issues and objectives outlined in section 1.2 of Chapter One. The aim was to improve the flow of the questionnaire. According to the Federal Committee on Statistical Methodology (1983) the flow of the questionnaire is an important element of questionnaire design because:

If questions about the same topic are included in several different places in the questionnaire, a respondent may become confused by perceived redundancy or hostile because of perceived carelessness and treat the survey interview with less seriousness than the investigator would like.

The questions were consecutively numbered in order to make them easy to follow. Sufficient space for recording the required information was provided and the instructions for completing the questionnaires gave respondents the option of using extra pieces of paper where the spaces that were provided were insufficient. As Rubin and Babbie advised (1997:198), questions were not unnecessarily crowded together in the hope of making the questionnaire look short. Each question was numbered to “prevent questions from being omitted in error and to facilitate the use of skip instructions” (Sudman & Bradburn 1983:230). Questions were only printed on one side of the page in order to avoid cluttering it. Even if there were covering letters accompanying the survey, the due date for returning the completed questionnaires and where to return them was repeated at the end of the questionnaires, in case they became separated from the covering letters.

Questions were grouped in sections with a logical sequence. Contingency questions were used in order to avoid wasting the respondents’ time on questions that did not apply to their situation. Contingency questions are sometimes referred to as screen or skip questions because on the basis of the answers provided for a particular question the respondent is instructed to go to another question (de Vaus 1996:93; Neuman 2000:259). Some examples of contingency

questions in one of the questionnaires that were used for data collection are question numbers 11, 16, 35, 42, 50, 63, 108 and 169 at Appendix Five.

4.2.5 Pretesting the questionnaires

The quality of data from a survey depends on the questions that are asked. Babbie and Mouton (2001:244) and Bernard (2000:254) pointed out that in constructing a questionnaire there is always a possibility of an error. Pretesting the questionnaire is necessary in order to uncover any defects in questions. Narins (2001) emphasized the fact that the pretest is an element of the survey process that is essential. Accordingly, no questionnaire should be considered ready for use until it has been pretested (Peterson 2000:119; Schutt 1996:285). In fact, without a pretest even experienced researchers can administer a faulty survey, putting into question any results. According to Churchill (1992:357):

The researcher who avoids a questionnaire pretest ... is either naïve or a fool. The pretest is the most inexpensive insurance the researcher can buy to assure the success of the questionnaire and the research project.

Questionnaires must be pretested or evaluated in order to improve the standards of questioning, before they are used in a survey (Fowler 1998:366; Peterson 2000:118; Powell 1997:105). According to Dane (1990:127) pretesting gives the researcher the opportunity to “fine-tune the instrument in much the same way that a bench check allows a technician to evaluate a part before installing it”. The purpose of evaluation is to maximize reliability and validity of the instrument (Cohen, Manion & Morrison 2000:260; Oppenheim 1992:46-48; Wilson & McLean 1994:47).

Evaluation of data collection tools identifies questionnaire items that are either not completed or misunderstood, and those that do not obtain the needed information (Verma & Mallick 1999:120). Questionnaires can be evaluated through focus group discussion, intensive individual interviews and field pretesting (Fowler 1998:366; Peterson 2000:117). It has been suggested that focus groups can help in evaluating the vocabulary and concepts used in survey instruments (Fowler 1998:366).

The purpose of cognitive or intensive interviews is to discover how the respondents understand and answer questions in the survey instrument without necessarily replicating the

data collection procedure. Whereas focus group are concerned with general perceptions and experiences of the respondents, and intensive individual interviews with problems of comprehension and response difficulty, the major concern of field pretesting is replicating to a reasonable extent procedures to be used in the proposed survey. This probably partly explains why some scholars refer to the exercise as a pilot study (Peterson 2000:117).

While it is accepted that the collective use of focus group discussions, cognitive testing and field pretesting can enrich the survey instruments, time and resource constraints dictated the choice of one of the evaluation techniques. The field pretest for survey questionnaires was used for the present study. When the questionnaires were in near final form they were circulated to a panel of experts consisting of a library and information science expert, an authority in questionnaire design, and a research methodologist. Certain types of questionnaire errors were identified before the questionnaires were pretested.

The questionnaires were then tried on a sample of respondents, to check ease of completion and whether the procedure had the desired effect (Burns 2000:579-580; Fowler 1998:366; Sapsford 1999:32). The recommended number for such an exercise is between 15 and 35 (Fowler 1998:369; Sapsford 1999:32). Hence, fifteen typical respondents were purposefully selected from the library and information science professionals at the University of Natal. The use of a convenience sample to pretest a questionnaire is the most employed approach (Peterson 2000:116).

Scholars are not agreed on the exact composition of a sample for pretesting questionnaires. The school that advocates the “warm bodies” approach argue that any person who is literate can be used for the pretest (Peterson 2000:116). Another school of thought supports the use of a sample composed of individuals selected from the potential respondents in the population to be studied (Fowler 1998:369). Each school of thought has merit. However, to cut down on costs an easy-to-execute approach was used for the pretest. The informants were selected on the basis of convenience and availability. The pretests of the two questionnaires were conducted according to some of the guidelines provided by Narins (2001) of SPSS®. The covering letter for pretesting the questionnaires is at Appendix Three. It was written according to the checklist for pretesting data collection instruments provided by Litwin (1995:68).

After the data was collected an assessment of how the whole exercise went was made. The data that was collected showed that it was likely to obtain the information needed to conduct the intended analyses. The patterns of answers from the pretest were sensible and easy to interpret. The estimates of time and costs were considered to be reasonable. As a result it was estimated that the survey would be completed within the proposed time scale. Unclear questions and instructions were identified by the pretest. In the same vein, technical terms and abbreviations that needed explication were identified. Double-barrelled questions were unpacked to ensure that one concept or issue was included in the questions. The questionnaires were also modified to remove some ambiguities identified by the pretest. The questionnaires were then posted to the archives repositories listed at Appendix One.

4.2.6 Administering the questionnaires

The questionnaires were distributed by electronic mail and through the conventional postal system. These two methods of administering a questionnaire are discussed in more detail below.

4.2.6.1 Use of the conventional postal system

Response rate is very important for the success of any survey (Slater 1990:53). The issue of non-response had to be contended with in the process of administering the questionnaire. A non-response error partly occurs when a significant number of people do not respond to the questionnaire (Salant & Dillman 1994:20). Non-response can undermine the validity and reliability of the survey results.

Robson (1993:250) provided a checklist of factors that can improve the response rate to postal questionnaires. Some of the factors are: design and layout of the questionnaire; initial mailing; covering letter; follow-up letter and further follow-ups. The two covering letters and the follow-up letter are at Appendices six, eight and eleven respectively.

In order to enhance the validity and reliability of the results of the survey, the questionnaires were administered using ideas from the Total Design Method (TDM) (Bernard 2000:250; Dillman 1978:160-199). Dillman (2000) admitted that TDM was developed a long time ago and other means of improving responses to self-administered surveys have to be used. Due to

technological and cultural changes, methods that have a one-size-fits-all nature are no longer appealing to researchers (Dillman 2000). Thus the Total Design Method was supplemented by strategies for maximizing the response rate to postal questionnaires suggested by Burns (2000, 580), Creswell (1994:122), Hudson and Miller (1997:103-105) and Mangione (1998:401-408). The TDM model advocates the distribution of a carefully constructed, pretested instrument and a cover letter, and multiple follow-up contacts to encourage a high response rate (Dillman 1978:160-199).

While, Creswell (1994:122) agrees with Dillman (1978) on the rationale of having clearly defined steps of administering and following up the instruments, their steps are slightly different, as illustrated in Table Eight below. In the case of Dillman (1978) the mailings are four in number.

Table 8: Steps for administering and following up questionnaires

Phase	Dillman (1978)	Creswell (1994)
One	Personalized advance notice letter	Initial mailing and stamped return envelope
Two	Mailing of the questionnaire after one week and stamped return envelope	Second mailing of the instrument after two weeks to those who have not responded
Three	After one week of original mailing send postcard thanking those who have responded and requesting for a response from those who have not	Third mailing of a postcard as reminder to complete and return the questionnaire
Four	Mailing of a letter and replacement questionnaire three weeks later	No further action

Source: Creswell (1994:122) and Dillman (1978:160-199)

In line with Dillman's (1978) model, respondents were given advance notice in July 2002 that a questionnaire would be sent to them. In that regard, postcards were sent to the heads of archival institutions listed at Appendix One. Questionnaires were sent later by first-class mail, accompanied by a covering letter and a pre-printed, stamped return envelope. The questionnaire to archival institutions consisted of 259 items (see Appendix Five) and the National Film, Video and Sound Archives questionnaire had 219 items (see Appendix Seven).

In line with the objectives of the study the questionnaires included questions on the following broad topics:

- Strategies and activities for preserving records and archives including, preservation policies and means; standards for preserving archives and records; buildings for the

storage of archival materials; light, temperature and relative humidity in places where archival materials were stored; pest management; storage and handling of materials; disaster preparedness and management; fire detection and suppression; and security and condition of records in general;

- Information technology and the preservation of archival materials including, digital materials policy; current digital holdings; and storage methods and formats used;
- Level of skills and knowledge in preservation management;
- Access to information contained in records and archives; and
- Legal situation related to the preservation of records and archives.

The covering letter described the project in order to motivate the respondents to cooperate. It emphasised the importance of the research and its advantages to society as a whole as well as how the information was going to be used. It also stated the benefits to the respondents of completing the questionnaire. The first mailing to the 14 archival institutions was done on 4 August 2002. That gave the respondents about two months to complete the questionnaire as the questionnaire was supposed to be completed and returned by 30 October 2002. It is quite obvious that while the Creswell-Dillman model depicted in Table Eight above, provided the framework for administering the questionnaire, the time frames were not adhered to the letter as the questionnaires used in the study were quite long and respondents needed ample time to complete them. In addition to posting through conventional mailing, six questionnaires were also sent through the e-mail to those archival institutions whose e-mail addresses were available.

4.2.6.2 Use of the electronic mail

The development of new telecommunications technologies has seen the emergence of electronic mail (e-mail) as a means of communication and a research tool (Frankfort-Nachmias & Nachmias 1996). Ever since market researchers pioneered the use of e-mail as a research tool many researchers in other fields are increasingly using e-mail to distribute their questionnaires (Mehta & Sivadas 1995). The major advantage of using e-mail as a research tool is the speed and immediacy it offers. The other advantage seems to be that e-mail questionnaires cost considerably less to administer, both in terms of money and time. As it is possible to send the same e-mail to multiple addresses in one action, a large “mail-shot” of

subjects is relatively straightforward (Selwyn & Robson 1998). In addition, as Boshier (1990) pointed out;

E-mail appears to provide a context for the kind of non-coercive and anti-hierarchical dialogue that Habermas claimed constitutes an “ideal speech situation”, free of internal or external coercion, and characterised by equality of opportunity and reciprocity in roles assumed by participants (Boshier 1990:51).

Out of the six questionnaires that were e-mailed, only two archival institutions responded by e-mail. The rest of the archival institutions responded to the questionnaires that were sent through the conventional mailing system. The e-mail system had a considerable effect when it came to sending out reminders to the respondents who had not returned the questionnaire by the 30 October 2002 deadline. A considerable number of archival institutions responded to the e-mails apologising for the delay in sending back the questionnaire and promised to do so within a few days. According to Roselle and Neufeld (1998:157) the major benefit of using e-mail for follow-ups is that it improves response rate and response speed. In the final analysis, cards were sent to all the respondents who had completed the questionnaire thanking them for taking part in the exercise.

4.2.6.3 Response rate to the mailed questionnaires

As mentioned in the preceding sections, response rates are a big concern in survey research. The point is revisited again to show the response rate of the questionnaires used in the present survey. Authorities are not agreed on what constitute an adequate response rate. Anything below 50 percent is considered to be poor and over 90 percent as excellent (Neuman 2000:267). On the other hand, Shipman (1997:63) argued that, although Hite (1994) used a response rate of 4.5% in his study, the normal figure is between 20% and 30%. However, Babbie and Mouton (2001:261) asserted that a response rate of 50% is adequate for analysis while responses of 60% and 70% are good and very good respectively.

Previous researchers in the field of preservation achieved varying response rates. For instance, Khayundi (1995:32) surveyed 47 institutions and received a response rate of 61.7%. Mbaye (1995:41) had a response rate of 35.71% from 28 institutions. In a survey carried out by Feather and Eden (1997:7), 200 questionnaires were completed and returned, giving a response rate of 68.97%. Seton (1984:1) surveyed 65 institutions in 28 countries and received

a response rate of 65%. In 1986 Clements (1987) carried out an international study to assess the state of the world patrimony and got a response rate of 49%. Derges (1992) carried out a study on the situation of audiovisual materials in the ESARBICA region and got a response rate of 66.67%, which represented eight respondents out of twelve. Murray (2002:55) surveyed 17 institutions in South Africa and had a response rate of 64.71%. The response rate of the present study was 64.29%, as nine out of the fourteen surveyed institutions responded. Many researchers respond to the problem of nonresponse by ignoring non-respondents (Sarantakos 1998:156). In line with other researchers, non-respondents were ignored on the assumption that the missing units of analysis were thought to be similar to those who responded, and that the study would not be drastically affected by the lost units. In fact, interviews revealed that two of the five institutions that never responded to the questionnaire had neither an archival infrastructure nor any archival holdings. Even the annual reports of the Directorate of State Archives and Heraldic Services of 1997-1998, 1998-1999 and 1999-2000 did not mention the institutions at all.

Indeed response rates affect the amount and quality of information available to the researcher. Perhaps, the response rate is the single most important indicator of how much confidence can be placed in the results of a survey (Smith 1999b). Nonresponse range from failure to return the completed questionnaire to item nonresponse that at times renders the returned completed questionnaire unusable as result of missing data (Sapsford 1999:95; Smith 1999b). Item nonresponse was not a major problem in conducting the present research. The researcher either telephoned or e-mailed respondents to get information that was missing in the completed questionnaires. However, nonresponse to the mailed questionnaire was a major problem as three institutions with an archival infrastructure were uncooperative.

The first mailing resulted in a 50% response rate. A reminder to complete the questionnaire (see Appendix Nine), a second copy of the questionnaire and a pre-paid reply envelope were mailed to those institutions that had not responded by 30 October 2002. Enclosing a stamped return envelope was not merely a matter of common courtesy. Research has shown that the response rate is substantially higher than when a pre-paid reply envelope is not enclosed (Nel, Rädél & Loubser 1988:195). The process of constant and well-timed reminders was designed to drive home one basic message, which was that every respondent's participation was

essential to the success of the study. Two questionnaires were returned after sending the reminders. The respondents in question did not have any archival holdings, but their responses as pertaining to the archival infrastructure at their institutions were considered to be valid.

4.2.7 Interviews

Interviews are one method by which a phenomenon may be studied. Interviews can be used for verifying, amending and extending data (Lincoln & Guba 1985:69-70), and gathering facts and explanations (Silverman 1993:92-93). Interviews have been criticized for being time consuming. In addition, the outcome of the interview could also be determined by the personality of both the interviewer and respondent. Despite these criticisms interviews have a number of advantages. Interviews have been characterized as the most effective way of enlisting the co-operation of most populations (Burton 2000d:323). The quality of data is usually superior to that obtained by other methods (Burton 2000d:323). Therefore, interviews were used to gather supplementary data as well as verifying some points that emanated from some of the responses to the questionnaire.

There are a variety of interviews. The actual number depends on the sources that one reads. For example, Patton (1980:206) gives four types, LeCompte and Preissle (1993) give six types and Oppenheim (1992:65) gives ten types. These types have been characterized, for instance, as standardized interviews, in-depth interviews, closed quantitative, structured interviews, exploratory interviews and many others. Apparently, the differences seem to lie in the structures and purposes of the interviews.

Based on both the target and mode of the interviews, Burns (2000:582) characterizes interviews into three categories. These include personal interviews, focus group interviews and telephone interviews. Although the potential of focus groups is considerable, they were not used because they are problematic to organise and the responses are difficult to code (Cohen, Manion & Morrison 2000:288). Only personal interviews were used in this study. Even if personal interviews are relatively expensive, they produce a better response rate than the questionnaire (Burns 2000:583; Oppenheim 1992:81-82; Powell 1997:112).

Personal interviews can range from structured, semi-structured to unstructured (Arksey & Knight 1999:7). In the structured interview the researcher strictly adheres to a script or interview schedule. Semi-structured interviews are less formal than structured ones in that the interviewer can explore issues that emerge by further asking follow-up questions. Non-structured interviews are narrative and non-directive. It is noteworthy that Hammersley and Atkinson (1995:152) argued that all interviews are structured and that “the important distinction to be made is between standardized and reflexive interviewing”. Unstructured or reflexive interviews were used to collect data for the present study.

According to the interview typology of Hammersley and Atkinson (1995:152) the interviews were structured in the sense that a list of issues that were central to the research questions was drawn up prior to conducting the interviews. On the other hand, it was reflexive because the interviewer was free to formulate the interview questions as dictated by the circumstances. Consequently, the interview measure did not necessarily have the same format and sequence of words and questions for all respondents. In addition predetermined definitions and possible answers were not imposed on the respondents; instead respondents were free to formulate their own definitions and description of the situation or event (Bless & Higson-Smith 2000:105). Although, unstructured interviews can be time-consuming as well as being possibly influenced by interviewer bias, their major attraction is that they facilitate the “discovery of new aspects of the problem by exploring in detail the explanations supplied by the respondents” (Bless & Higson-Smith 2000:108).

4.2.7.1 Administering interviews

It has been argued that validity is a persistent problem in interviews (Cohen, Manion & Morrison 2000:120). For instance, validity can be compromised by asking leading questions, and bias on the part of both the interviewer and the respondent. One way of avoiding bias was desisting from seeking answers that supported any preconceived notions of the interviewer when conducting the interview. Leading questions were also avoided because they tend to influence the answers of the respondent (Morrison 1993:66).

Six heads of selected archival institutions were personally interviewed in a face-to-face situation to get their views about the preservation of, and access to public records and archives

in South Africa. Initially, the research targeted seven heads of archival institutions, including five heads that had not responded to the survey questionnaire, but the fifth head remained very elusive despite several attempts that were made to set down an interview date and time. The heads of archival institutions that had not responded to the questionnaire were deliberately targeted for the interviews in order to improve the response rate. Thus, it was possible to get supplementary information on preservation of, and access to records and archives from some of the institutions that failed to respond to the survey questionnaire. One could argue that the approach improved the response rate to some extent. According to Dillman and others (2001) changing modes of data collection can improve response rates. It was in this light that non-respondents to the mail survey were deliberately targeted and interviewed in order to get a partial picture of preservation and access issues pertaining to their institutions.

After every interview, the interviewer summarised all the answers and presented them to the respondents in order to clear any misperceptions on the part of the interviewer of what the respondent would have said. Convergent validity was also used to validate the interview measure. According to Cohen, Manion and Morrison (2000:120) convergent validity is the comparison between an interview measure and another research tool that would have been validated. The process involved comparing the interview results with the questionnaire responses. The results of the two tools tended to agree in most cases.

Interviews, as Nisbet and Watt (1980:13) pointed out, provide important data, but in most cases they reveal only how people perceive what happens, not what actually happens. Observation might be more reliable than what people say in many instances. It can be particularly useful to discover whether people do what they say they do. Observation techniques are discussed in the following section.

4.2.8 Observation

All research entails observation (Coolican 1999:18). Observation has been characterized as “the fundamental foundation of all research methods” in social and behavioural sciences (Adler & Adler 1999:389). LeCompte, Preissle and Tesch (1993:196) characterized observation as “a method relying on watching, listening, asking questions, and collecting things”. A study of the literature reveals two basic types of observation, namely, human and

mechanical recordings. Both types of observation techniques can be either structured or unstructured. In structured observation, the observer knows in advance what aspects of a situation are to be observed and which criteria would apply. On the other hand, in unstructured observation the aspect of the situation to be observed are not specified in advance.

Human observation techniques were used to gain some insight into the preservation of archives at four selected archives repositories. Two of the selected archival institutions had archival holdings, and of the two, one was accommodated in a purpose built archival repository. On the other hand, the other two archival institutions that were observed had neither an archival repository nor archival holdings in their custody. The observation technique was used to gather supplementary data that helped to further interpret findings obtained by the interviews and questionnaires. The technique has the advantage of recording behaviour as it occurs as opposed to the second hand information obtained by other research instruments (Patton 1990:203-5).

Moreover, many other research techniques depend entirely on people's retrospective or anticipatory reports of their own behaviour and environment. Additionally, observation is independent of people's willingness to report. Observational data are attractive because they are superior to data collected through techniques such as experiments and surveys, especially, when data are being collected on non-verbal behaviour (Bailey cited in Cohen, Manion and Morrison 2000:188).

Contrary to the popularly held view that observational data is unquantifiable, studies have demonstrated that it is a misconception to regard it as such (Burns 2000:412). Structured observation can provide useful numerical data (Cohen, Manion & Morrison 2000:309). In fact, Burns (2000: 412) argued that observational data could be quantified as long as the researcher knows what is to be observed and recorded. Developing a standardized observation technique is key to getting objective findings (Angrosino & Mays de Pérez 2000:676). According to Gold (1997:397), a standardized procedure can, maximize observational efficacy, minimize investigator bias, and allow for replication and/or verification to check the degree to which these procedures have enabled the investigator to produce valid, reliable data that, when incorporated into his or her published report, will be regarded by peers as objective findings.

Hence, an observation schedule at Appendix Eight was drawn up in order to have a standardized procedure of noting down the incidence of the factors being studied (Burns 2000:408; Punch 2000:57). Structured observation was used because it provides a systematic description and generation of numerical data (Cohen, Manion & Morrison 2000:306; Powell 1997:119). A pilot study was conducted at Pietermaritzburg Archives Repository and the University of Natal Archives to ascertain the appropriateness and exhaustiveness of the observational categories. The reliability of the observational data was not affected by the Hawthorne effect because most of the variables that were observed could not be easily manipulated (Diaper 1990). For instance, it is not easy to manipulate the condition of the building storing records at the wink of an eye. Reliability was achieved by increasing the numbers of observations made for each variable (Cohen, Manion & Morrison 2000:131).

The observational categories that were employed included building conditions, storage environment and handling procedures, disaster preparedness plans, and policies that affected preservation. The selected archival buildings were inspected outside and inside from a preservation perspective. The aim was to identify potential hazards to the collection (from the environment or from storage and handling procedures), and actions required to ensure the long-term preservation of collections (for example improving housekeeping, storage enclosures, fire protection and environmental control). The notes were recorded soon after each observation. The notes were comprehensively written as they were supposed to serve as reference sources during the project write-up phase. Documentation pertaining to disaster plans and preservation policies were also requested during site visits.

4.2.9 Processing and analysis of data

There is no consensus about what data analysis entails (Coffey & Atkinson 1996:6). The differences attached to the concept of data analysis are directly related to the qualitative and quantitative paradigms discussed in section 4.1.1 above as well as the nature of the research question and design.

Qualitative methodologists like Wolcott (1994) and Miles and Huberman (1994) viewed it from a different angle as compared to quantitative methodologists such as Alreck and Settle (1995) and Kerlinger (1986). Wolcott (1994) used the term transformation to refer to

strategies of dealing with data. Wolcott (1994) categorized the process of data transformation into three types: description, analysis and interpretation. Wolcott (1994:34) restricted analysis to the procedure of identifying essential features and relationships. To some authors, it primarily means data handling. For others, it means categorizing and interpreting the data. Miles and Huberman (1994:16) defined data analysis as three linked sub-processes: data reduction, data display, and conclusion drawing. Data reduction involves data evaluation and coding. Data display refers to the ways that the reduced data are displayed in diagrammatic, pictorial or visual forms in order to show what those data imply. Data display is an “organized, compressed assembly of information that permits conclusion drawing and/or action taking” (Miles & Huberman 1994:429). Finally, displayed data are interpreted and conclusions are drawn.

In the quantitative paradigm, which informed this study, data analysis entailed categorizing and summarizing data in order to answer the research question. According to Kerlinger (1986:125-126) data analysis involves the categorizing, ordering, manipulating and summarizing of data to find answers to the research question. Accordingly, Alreck and Settle (1995:267) described data analysis as:

the use of statistical tools in order to reduce the amount of details in the data, summarizing it and making the most important facts and relationship apparent.

At the data analysis stage of this project, the principal aim was to extract all the relevant data, which were hidden in the mass of collected raw information. Thus, the survey data was evaluated and analysed. The former was concerned with making judgements about the quality of data, while the latter summarized the research results. Typically, data were analysed in order to describe the characteristics of the units of analysis, make predictions about specific relationships, and to test associational relationships (Powell 1997:61).

4.2.9.1 Data evaluation

The data collected through the questionnaires were evaluated and cleaned before coding (Cooper 1998:78; Powell 1997:61). These two activities are sometimes referred to as data editing (Cohen, Manion & Morrison 2000:265). The purpose was to check for ambiguity, completeness, comprehensibility, internal consistency, relevance, and reliability (Powell 1997:63). Hence data was examined to look for extreme values, conflicting answers,

handwritten notes, errors in recording, and other indicators that suggest unreliable measurements (Litwin 1995:53). It involved checking whether or not there was an answer to every question. What was equally important was checking whether or not the respondents adhered to skip patterns.

Before any questionnaire was discarded as unusable, answers were crosschecked from other sections of the survey. All questions were examined to check for the accuracy of the answers. A decision was made during editing to content analyse responses such as “cannot remember” or “unsure”. The uniformity of the interpretation of the questions by the respondents was also checked during the process. The concept of content analysis is explicated in section 4.2.11 in the ensuing pages.

4.2.9.2 Data coding

As advised by Babbie and Mouton (2001:260) each completed questionnaire that was received was assigned a unique case number, which was inserted in the space provided on the first page of each questionnaire. Each questionnaire represented a case that was studied, and the code “caseid” was assigned in the first column of the SPSS® Data Editor. The identifier “caseid” was used for each responding case to facilitate checking the data for errors. Without the unique number, it would be extremely difficult to tie data back to the original questionnaire, thus, making the task of identifying or correcting data entry errors complicated. In addition, some data handling and analytical tasks are possible only if there is a way of identifying individual cases (Narins and Walter 2001).

The questionnaires were not pre-coded; that was done at the same time as the editing of the questionnaires by the researcher. Coding involved assigning a label to each question or variable, and a number or value to each response category. For instance, the variable name for question number 11 at Appendix Five was given as “missions” and the value labels were 1 for “yes” and 2 for “no”. Each variable for closed questions was assigned a name. After developing a list of coding categories, variables for the questionnaires to archival institutions became 492. The National Film, Video and Sound Archives questionnaire was not coded because the response was not received. There was a disparity between the questionnaire items and the coded variables because each possible response, or value, was assigned a number.

Coding transformed raw data into symbols that could be tabulated and counted. Coding also dealt with missing values. In order to process the data taking into consideration the missing value, “no answer” was given as “99”, a value that was not likely to be assigned for any of the variables in the data.

However, not all answers to the instruments were reduced to code numbers. Open-ended or verbatim responses were kept as text. The responses were content analysed and grouped into categories that were tabulated manually. The process involved going through each of the responses and writing down all the responses that were relevant to the research objectives. Each unique response was recorded only once in columns, and a separate row track was kept of the number of times the item was mentioned. After going through several questionnaires, a pattern began to emerge. The picture that emerged from content analysing open-ended questions and verbatim responses was incorporated in the narrative description of the results. Content analysis is further explicated in the following section.

4.2.9.3 Content analysis

According to Kothari (1990:137) content analysis is concerned with investigating the contents of documentary and verbal materials. According to Alreck and Settle (1995:271) content analysis is collecting and organizing information systematically in a standard format that allows analysts to draw a conclusion about the characteristics and meaning of recorded material. The technique can be applied to any form of communication (Babbie & Mouton 2001:383; Neuman 2000:292). Thus, open-ended questions in the questionnaires and interviews were content analysed. The first step in content analysis entailed the construction of categories. According to Sarantakos (1998:281) a category is “a set of criteria which are integrated around a theme”. The objectives of the study stated in section 1.2.2 of Chapter One were the building blocks for the categories that were selected. The categories were examined using one of content analysis’ basic methods, namely, conceptual analysis or thematic analysis. The analysis involved quantifying and tallying the presence of a concept. Thus, after identifying the categories data was coded. The coded data offered some evidence about the dominant categories and trends. Some of the data was presented in narrative form or was integrated into the quantitative data collected by means of questionnaires and observation for analysis using SPSS®.

4.2.9.4 Computer processing

LeCompte and Preissle (1993:280-1) provided a summary of how computers could be used in research. Their list indicates the diverse use of computers in research such as word processing, bibliographic control and statistical analysis. However, for the purpose of the present study Word Perfect® Version 9 and Microsoft Word® were used for word-processing, EndNote® Version 5 for managing bibliographic references and SPSS® Version 11.0 for Windows for statistical processing. The major advantage of computer processing is that it speeds up processing and analysis of data as well as saving and eliminating a good deal of tedious and repetitive work. Once data has been entered into a computer it becomes very easy to statistically manipulate the data using a range of statistical tests.

Although, there are many academically and commercially successful software packages for the analysis and presentation of data like Microsoft Excel®, SAS® (Statistical Analysis System), Minitab®, EPI-Info®, Statistica®, Systat®, and Statgraphics®, SPSS® was selected because it is the most widely used statistical software in the academic community throughout the world (Arksey & Knight 1999:156; Foster 1998:22; Moore 2000:136; Slater 1990:82), and according to Brace, Kemp and Snelgar (2000:12) it is a very powerful statistical program. SPSS® facilitated the sorting of data and computing of frequencies, sums, means, percentages, standard deviations and exploring similarities and differences among variables.

4.2.9.5 Entering data

Data entry is highly tedious, prone to error and critically important. There are several ways to getting data into the computer (Narins 2001; Narins & Walter 2001; Neuman 2000:315). They include code sheets, direct entry, optical scan sheets and Computer Assisted Telephone Interview (CATI) (Neuman 2000:315). The researcher directly typed the data into the computer. It is worth noting that regardless of the method used errors are inevitable. Thus, the data output from the computer should always be examined for statistical outliers or extreme cases caused by recording errors (AssnBarnett & Lewis 1984:53; Fink 1995:73). The process of checking data accuracy after inputting is referred to as cleaning. According to Narins and Walter (2001) the accuracy of data can be check through one of the following ways:

- Double entry: the data is entered twice and discrepancies are verified against the original questionnaire;

- Running frequency distributions and scanning for errors in values based on the original questionnaire, for example, if only two responses are possible, there should be no value “3”; and
- Data listing, which involves verifying a random sample of cases on a printout of the values for all cases that have been entered against the original questionnaires is another way for checking for errors. It is worth noting that running the command CASE SUMMARIES under the item menu ANALYZE in SPSS® will yield a list of the first hundred cases in a data set.

After having been cleaned, the data became ready for tabulation and statistical analysis. This meant that one or more of the following could be done on the basis of the collected data:

- Describe the responses made to each of the questions;
- Describe the frequency distribution of variables; and
- Determine if there is a relationship between two characteristics or variables.

4.2.10 Statistical analysis

Most social science research collects information about units of analysis and then expresses the information in the form of statistics (Schutt 1996:373). There are a number of different statistical techniques, which are used to analyse data that have been collected in research. The choice of statistics used in the study was not done arbitrarily. After checking the assumptions behind most statistical analyses and the level of measurement of the variables, the commonly used statistics for nominal and ordinal data types were selected from the literature (Cohen, Manion & Morrison 2000: 80, 317; Hopkins, Hopkins & Glass 1996:35).

Descriptive and inferential statistics are the commonly used types of statistics in social science data analysis (de Vaus 1996:134). Descriptive statistics are used to describe the characteristics of a population while inferential statistics are used to make some inferences about the characteristics of a phenomenon based on certain parameters. Inferential statistics can also be used for testing hypotheses. Although inferential statistics are widely used in social science research, they are not described in this study, as they were not employed. Instead the next section discusses descriptive statistics.

4.2.10.1 Descriptive statistics

According to Brace, Kemp and Snelgar (2000: 59) a research report should always include descriptive statistics. Arksey and Knight (1999:158) emphasized that the first level of analysis involves descriptive statistics. Descriptive statistics are one of the procedures used to summarize data. They allow researchers to accurately describe a large volume of data with just a few values (Brace, Kemp & Snelgar 2000:59). Descriptive statistics fall into one of two categories: measures of central tendency (for example, mean, median, and mode) or measures of dispersion (for example, range, standard deviation and variance). Measures of central tendency provide a point around which items have a tendency to cluster. The mean is the arithmetic average, the mode is the most frequent score and the median is the middle score in a group and it is sometimes referred to as the “typical” observation (de Vaus 1996:139; Fink 1995:18). The mode is used to show the most “popular” value.

Range is the difference between smallest observation and the largest. Variance refers to the variability of score about the mean. The mean and the standard deviation are commonly reported in research articles (Aron & Aron 1997:40). The standard deviation, which measures how much the scores vary around the mean, is by far the most commonly used method of summarizing dispersion (Fink 1995:23). It is the key basic statistical technique, which is requirement of many more advanced techniques (Wilkinson 2000:88). Each score in the population or sample will deviate from the mean by some amount. It is calculated by finding the square root of the variance. It is used to assess the reliability of mean as a measure of central tendency. A large standard deviation means that the mean cannot be taken as reliable indicator of a central value in a distribution. The calculation of measures of central tendency and dispersion depends on the manipulation of variables. A brief discussion of the nature of variables that are encountered in data analysis is given below.

Patterns of data and relationships between variables can be established using univariate, bivariate, and multivariate analysis (Bernard 2000:539). This study used univariate analysis. Univariate statistics are concerned with one variable. The measures of central tendency and dispersion described above help researchers to examine key features of each variable. Bivariate statistics deal with a relationship between two variables. Multivariate analysis involves understanding the effects of more than one independent variable at a time on a

dependent variable. Bivariate and multivariate analyses were not used in the present study because the level of measurement and scales that were used did not easily lend the data to major statistical analysis such as correlation and regression. For instance, of the two most commonly used correlation coefficients the Spearman's *rho* can be used for variables at ordinal level and Pearson's Product Moment Correlation Coefficient is used for interval data (Fink 1995:38; Kothari 1990:172).

Before summarizing this chapter and evaluating the research methodology lets briefly turn to ethical considerations that informed the research procedures outlined in the preceding sections.

4.3 ETHICAL CONSIDERATIONS

Concern about the ethics of research has not always been as intense as it is today (Rubin & Babbie 1997:59). One of the problems in social research is conducting the research ethically (Bernard 2000:21). The origins of concerns about research ethics are to be found in medical research but this has broadened to include all research with human subjects. Ethics are key to developing moral standards that can be used in situations where there can be actual harm or potential harm to an individual or a group (Churchill 1992:68). Essentially, a sound thesis is a product of ethically obtained and scientifically valid data (DeBakey & DeBakey 1975:539). There is limited literature devoted explicitly to the ethics of library and information science research. There is, it is true, quite a bit of discussion of relevant issues in the more general literature on social science research. In library and information science journals there is remarkably little discussion. Although, scandals in library and information science research are rare, ethical, moral and political questions abound (Burns 2000:23).

Questions of access, power, harm, deception, secrecy and confidentiality are all issues that the researcher has to consider and resolve in any research context (Cohen, Manion & Morrison 2000: 246). Informed consent occupies a central place in the ethics literature. It has wider application than just field relations in ethnographic work but also applies to survey work, statistical investigation and action research. The respondents to the questionnaires and those that participated in the observations and interviews were told the purpose of the study and they willingly took part.

Data collection, processing and dissemination also raise important ethical issues. Thus, Sarantakos (1998:22) argued that methodological rigour is an ethical, and not simply a technical matter. Respondents have a right to expect reliable and valid questions. The survey was carried out according to the procedures that are outlined in the preceding sections. No preconceptions or prior values shaped the results. The original conceptualization of the research and the measurement of variables did not reinforce a stereotype to the detriment of reality.

In other words, the research used a relevant research method chosen from the literature and maintained objectivity in gathering and analysing data. Although, our perception and the environment can influence objectivity, its pursuit is a very noble one. As the renowned philosopher, Donald Campbell (1974), noted:

...the goal of objectivity in science is a noble one, and clearly to be cherished. It is in true worship of this goal that we remind ourselves that our current views of reality are partial and imperfect (Campbell 1974:447).

In addition, the research findings were presented honestly, without deliberate distortions. In presenting the results it was important to bear in mind that other researchers would use the results of the research to develop their theories and if the analysis of data were not correct, other researchers would be misled by the results (Dane 1990:52). The outcome of the research is not likely to harm any of the respondents. If the outcomes of the study were implemented they would contribute to “best” practices in the preservation of public records and archives.

Despite the fact that this study was not commissioned research, feedback to the respondents will be in the form of scientific reports, which will give details of the findings of the study as well as direct feedback to the archival institutions as promised in the covering letter to the questionnaires used to collect the data for the study. The implementation of the findings or the lack of it will also serve as a feedback mechanism. It is hoped that the feedback mechanisms suggested above would serve as a departure from the tradition of doing research, which is of no service for the respondents (Sapsford 1999:41-42). Feminist advocates such as Reinharz (1979:95) have equated the research approach that does not benefit units of the study in one

way or another to the process of rape, whereby:

the researchers take, hit and run. They intrude into their subjects' privacy, disrupt their perceptions, utilise false pretences, manipulate the relationship and give nothing or little in return. When the needs of the researchers are satisfied, they break off contact with the subject.

Last, but not least, all assistance, collaboration of others and sources from which information was borrowed from have been acknowledged to the best ability of the author of the thesis.

4.4 EVALUATION OF THE RESEARCH METHODOLOGY

Research methods have weaknesses as well as potentials. Research methodologists recognise that both qualitative and quantitative methods have something to offer (Creswell 2003; Hodson 1999). The degree to which they are able to serve the desired research purpose largely depends on the researcher's understanding of their strengths and limitations. In fact, Sproull (1995:136) argued that: "No one type of research design is universally better or worse than any other. They are different and used for different purposes". Sections 4.1 and 4.2 of this chapter discussed the quantitative approach that informed this research. The survey research design guided the research procedure.

As outlined in section 1.2.2 of Chapter One, the purpose of the research was to provide basic information needed to enable staff to both plan and implement sound records and archives care programmes and contribute to their preservation and accessibility. The goal was to provide a broad picture of preservation of, and access to public records and archives in South Africa. As a typical descriptive research, the research was designed to answer questions of a univariate and normative nature, that is, "describing only one variable, comparing the variable to a particular standard, or summarizing the relationships between two or more variables" (Bickman, Rog & Hedrick 1998:15). The major strengths of survey research are the economy of design and the rapid turn around in data collection (Bickman, Rog & Hedrick 1998:15; Creswell 2003:154).

However, its major limitation is that it cannot provide information on cause-effect relations like experimental studies. In addition, all survey methods are handicapped by non-response (Goyder 1987). Non-response is not only affected by the percentage of the units of analysis

that fail to respond to the questionnaire, but by the way the respondents complete the questionnaires, the uneven impact of questionnaire structure and question wording as well. With careful planning and execution the effect of these limitations was minimized. Pretesting the questionnaires before collecting data was one way of minimizing the ambiguity of the data collection instruments. Documentary evidence points to surveys securing accurate views from respondents. As pointed out in section 4.2.4 of this chapter, Alegbeleye (1988), Coates (2000), Clements (1987), Conway (1991), COSHRC (1993; 1996; 1998), Feather and Eden (1997), Khayundi (1995), Lowell (1986), Mazikana (1995), Mbaye (1995) and Trinkaus-Randall (1990) used questionnaires with reasonable success in collecting data on the state of the preservation of documentary materials in various parts of the world.

The survey method gained prominence during the period of positivism. Positivists distrusted knowledge claims that were not based on empirical facts that are verifiable (Pring 2000:90). In short, it rejected “philosophical and religious beliefs which gave a non-empirical account of the world” (Pring 2000:90). In the 1970s interpretivists and constructionists attacked the positivists agenda (Pring 2000:95). As opposed to the positivists they argued that the world was more of a social construct rather than a physical reality. Therefore, the social world should be interpreted in the light of social constructs as well as the perspectives and interactions of the members of the social groups being studied. Postmodernists, however, rejected the idea that there is a “complete and scientific explanation of physical and social reality” as well as “the ‘enlightenment’ view that reason, in the light of systematically researched evidence, will provide the solutions to various problems we are confronted with” (Pring 2000:110).

Thus, truth is whatever we agree to call it, “there is no Archimedean point from which to observe the world that is independent of it” (Hoggart, Lees & Davies 2002:2). The postmodernist cultural and intellectual revolt is based on the rejection of knowledge and reality that is dictated by people in positions of power, for instance, university professors, the editors of journals, publishers and reviewers of books who decide what is to be published.

Each school of thought has merits. Traditional social scientific methods and approaches, and postmodernist frameworks are both important in conducting research. They should exist side-

by-side tapping from each other's weaknesses and strengths. Researchers should understand the variety of possible research strategies, approaches and techniques available to them and be able to justify the choices they make (Blaxter, Hughes and Tight 2001:86). No method is better than the other. Hence:

To know the history of science is to recognize the mortality of any claim to universal truth. Every vision of scientific truth, every model of natural phenomena, has proved in time to be more limited than its adherents claimed. The survival of productive difference in science requires that we put all claims for intellectual hegemony in their proper place... (Fox Keller 1985:178).

Whatever research methodology one uses, the interpretation of reality will remain subjective, conditional and tentative. As Carr (1997) pointed out:

A central tradition in philosophy has been to question received arguments and to seek the truth whilst knowing that the conclusions would always remain provisional, to respect those texts which encapsulate a well-argued position without regarding them as beyond criticism or improvement, to respect the giving of reasons whilst recognising that the canons of good reasoning might evolve through criticism or vary according to type of discourse (Carr cited in Pring 2000:114).

Having said that, it is important to bear in mind that Rowley (2002:18) observed that the positivist approach is straightforward and provides a better foundation for understanding and managing issues pertaining to validity and reliability as well as structuring data collection and analysis. It was in that light that the research design of this study was based on the positivist survey paradigm. The choice was also dictated by the nature of the problem under investigation as well as the time and resources available for the research.

The goal was to describe the administrative context of archival preservation and the broad scope of preservation activities in South Africa in order to demonstrate the challenges faced by the archivists that deal with public records. The study was exploratory in nature. The aim was to get as much information as possible rather than obtain a statistical sample. It was unfortunate that some stakeholder organisations did not cooperate with the researcher despite countless effort to get them to participate. A fuller picture of preservation activities could have been given by getting data from all the 14 units of analysis identified at the conceptualisation of the study.

Much as the researcher would have wanted to go on collecting data and persuading the institutions that had not provided any data to cooperate, there had to be a cut-off point that was dictated by the research schedule and available resources. Despite the problems that were encountered in getting the participants to cooperate, the research experience was really enlightening and the researcher drew solace from the fact that:

In a small-scale research, you cannot expect to collect all the data you might like. No social research project, in a more general sense, is ever going to provide the last, definitive word on any topic. The purpose of small-scale research is likely to be a mixture of practical application, illumination, self-directed learning and/or research training (Blaxter, Hughes and Tight 2001:188).

Interviews and observation methods were used in conjunction with questionnaires to collect data for the study. Once sufficient data was collected, it was analysed as outlined in the next chapters. In a more or less similar study Chilvers (2000) only used interviews to gather data from 12 stakeholder institutions in the UK to determine the preservation of digital objects in the country. The use of more than one method in collecting data for the present study was aimed at enhancing the validity and reliability of the results.

4.5 SUMMARY

This chapter stressed that research procedures are fundamental to gathering data to address a research question. It outlined the methods and techniques that were used in investigating the preservation of, and access to public records and archives in South Africa. It was revealed that research is basically done to describe or understand certain situations. The research process is commonly informed by either the qualitative or quantitative paradigm. At times a combination of both models is used.

The survey research design was described as the main research procedure employed by the study. Explanations were given why each instrument for data collection was selected. Principles such as validity, reliability and ethical standards, which informed the research process, were presented. The units of analysis and the methods used for data collection and analysis were also discussed in this chapter. The use of univariate analysis in conjunction with descriptive statistics was also explicated. The results of the investigation are presented and interpreted in the chapters that follow.

CHAPTER FIVE: PRESENTATION OF DATA

Science is built up of facts, as a house is built of stones; but an accumulation of facts is no more a science than a heap of stones is a house (Henri Poincaré Science and hypothesis (1905) cited in Frank (1999:756).

5.0 INTRODUCTION

The previous chapter explained how the study was conducted, that is, what was done in order to collect data to answer the research question. Its major aim was to aid the reader to replicate the study as in the original if need be as well as to help other researchers to estimate how much confidence could be placed in the findings. Furthermore, it should be possible for other researchers to compare the procedure with methods used in similar studies and explain the differences in findings among studies on preservation of, and access to public archives and records in terms of the differences in research methods.

This chapter analyses the data obtained from the population of the study, while the next chapter is devoted to the interpretation of the results of the study. The objective in this chapter is to transform heaps of raw data into some meaningful facts. However, the survey data should be treated with caution. It was evident from the interviews that the participating respondents had never before been asked to provide exactly the same set of data requested by the survey questionnaire, although some of them had provided some of the data for previous surveys. Where it was not possible to obtain exact responses to the survey questions, respondents were asked to provide estimates. Furthermore, the survey population was quite small and some units of analysis did not respond. Some of the archival institutions that were surveyed neither had an archival infrastructure nor archival materials in their custody.

The data that is presented in this chapter are not associated with any particular archival institution. To encourage full and frank participation, respondents were promised that their institutional data would not be individually identifiable (see Appendix Four). The data presented in this chapter was obtained from questionnaires, interviews and direct observation.

The results are organised according to the themes of the research issues that were raised in section 1.2 of Chapter One. The findings are presented as verbal descriptions and symbolic

representations like graphs such as bar graphs (histograms), pie charts and figures. According to Locke, Silverman and Spirduso (1998:173) graphics are more effective than word descriptions for portraying complex relationships between or among variables.

Tables are also suited for displaying primary findings (Locke, Silverman & Spirduso 1998:173). Tables were used to display the values of the results in numerical form. In most cases, tables were used where results could not be easily expressed in text (Nicol & Pexman 1999:4). The whole point of a table is to present data in an organised fashion that makes them easier to understand and interpret. Descriptive statistics were used to manipulate and summarize numerical data as discussed in section 4.2.10.1 of Chapter Four. Univariate analysis discussed in the previous chapter was also used to summarize and display the data.

5.1 STRATEGIES AND ACTIVITIES FOR PRESERVING PUBLIC RECORDS AND ARCHIVES IN SOUTH AFRICA

The data presented in this section is from the variables that were measured to assess activities and strategies used in the preservation of records and archives in South Africa. Institutional holdings, types of records held, preservation policies and means, standards for the management of records, buildings for the storage of archival materials, environmental control and monitoring, pest management, storage and handling, disaster preparedness and security of records and the general state of records and archives in archival repositories were used as indicators to assess preservation strategies and activities in South Africa.

5.1.1 Institutional data and holdings

Although the results are presented in aggregate, the first eight items of the questionnaire sought background information on the archival repositories as well as the size and composition of their archival holdings. The information that was sought included the name of institution, postal address, telephone, fax, electronic mail address, website uniform resources locator (URL), volume of holdings in linear meters, dates encompassed by the records and archives, and the media in each repository's archives expressed as a percentage of the total holdings.²⁵ This information was essential because understanding the nature of preservation activities hinges upon knowing the location of the archival repository, magnitude of the

²⁵ Except where otherwise stated, percentages are rounded up to two decimal places.

holdings, types of record media and their age, which is intrinsically linked to the expected life span of each document storage medium. Furthermore, such information helped to gauge the relevance of the preservation strategies used by the archival institutions that share stewardship of South Africa's documentary heritage.

Several things about the media in various archival repositories are notable. The surveyed repositories collectively held 121 718 linear metres of records. These figures compare favourably with the statistics of archival repository records occupancy presented in Table Five in Chapter Three. The fact that there were no major discrepancies in the data presented in Table Five and the data collected by the present study showed that some degree of reliability could be attached to it. Although the holdings were predominantly paper-based, photographs, microforms, electronic records and audiovisual materials were also part and parcel of the type of record formats found in archival institutions in South Africa. Table Nine presents the type of recording media reported by respondents.

Table 9: Types of records held in archival repositories in South Africa

Types of records	Average percentage of the total holdings
Paper	98.18
Video tapes	0.57
Magnetic tapes	0.5
Microforms (for example, microfilm, microfiche)	0.38
Photographs	0.35
Electronic records from creating departments	0.01
Computer media (tapes diskette, CD-ROM)	0.01

Current holdings of photographs, microforms, electronic records and audiovisual materials were extremely low, and few indicated that they were actively acquiring them. Respondents were also asked about the date spans of holdings because paper records, which constituted the greatest type of documentary media in archival institutions in South Africa, decay over time through natural aging subject to various environmental conditions. The majority of the respondents held records from the 19th century. Only one repository held 17th century (1648) materials. Respondents were also asked if their respective institutions inherited any archival

records from central government and former homelands. This information was essential since the South African archival landscape is based on a decentralized provincial system. Six (66.67%) of the respondents inherited holdings from former homelands. Interviews with some of the respondents revealed that their archival institutions were yet to receive archival documents that were still being kept in other provinces in South Africa once they build a viable archival infrastructure.

5.1.2 Preservation policies and means

Policies are important because they set out goals to be achieved as well as guidelines for implementing them. The respondents were asked if they had mission statements for their archival repositories. There was no clear understanding among respondents as to what a mission statement was. All nine claimed to have a mission statement. However, only four of the nine respondents stated their mission statements. The content analysis of the mission statements they stated revealed that their mandate was:

To foster national identity and the preservation of rights by preserving a national archival heritage for use by the government and people of South Africa, and by promoting efficient, accountable and transparent government through the proper management and care of government records.

Eight believed that the legislation giving them the mandate to keep records and archives was a mission statement. A notable pattern emerging from the analysis of the findings is that the wording of their mission statements was not similar to that in their archival legislation. One of the archival repositories perceived its preservation policy as a mission statement. Table 10 summarizes the responses of the respondent.

Table 10: Name of document containing mission statement

Name of document	Frequency	Percent
National Archives and Records Service of South Africa Act	6	66.67
Provincial Archives Act	2	22.22
Preservation policy	1	11.11
Total	9	100.0

Respondents were also asked to give details about their preservation policies. Preservation policies are important because they outline explicitly the responsibilities of the archivists for

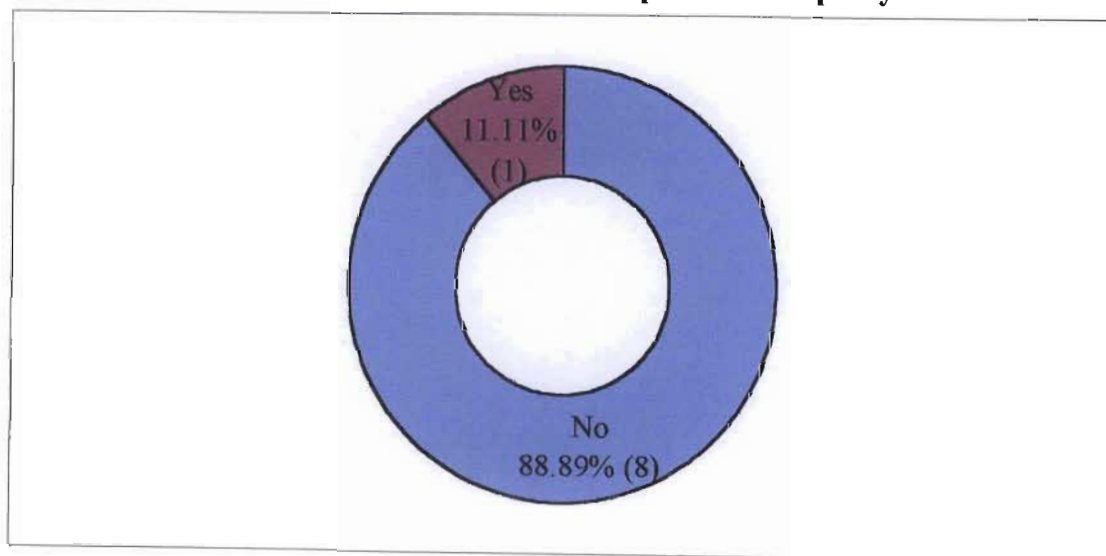
the preservation of archival materials of all types in order to guarantee access to the information they contain, both for the current generation and for generations to come. Table 11 presents the data on some of the de facto policies that pertain to the preservation of documents that were reported by the respondents.

Table 11: Policies to deal with preservation matters

Transferring records into other media (digitisation)	Microfilming records	Developing conservation facilities	Training and recruiting qualified personnel	Improving preservation conditions
0	2 (22.22%)	2 (22.22%)	3 (33.33%)	4 (44.44%)

However, the majority of the surveyed institutions did not have a document outlining policies in relation to preservation. One (11.11%) out of the nine surveyed institutions had a written preservation policy. The doughnut chart in Figure Four graphically shows the percentage of institutions with a written preservation policy.

Figure 4: Number of institutions with a written preservation policy



Three (33.33%) intended to formulate a preservation policy in the near future, but not in the next twelve months. Although most institutions did not have a written preservation policy, five (55.56%) reported that they had a preservation strategy.

Question 19 asked respondents about their organization's annual spending on salaries, building maintenance, management, storage, and use of the records in order to determine the spending patterns in relation to archival services in South Africa as well as ascertaining the financial means that were at the disposal of the archival institutions. Respondents were asked to choose from a list of figures ranging from R10,000 to more than a million rands, the category into which their institution's annual budget fell. Resources allocated for archival programmes showed great disparity and varied from province to province. The expenditure of two (22.22%) archival repositories was reported to be between R50,000 and R249,000. Three (33.33%) repositories spent between R500,000 and R999,000. Table 12 summarizes the results of the respondents. Of the four repositories that said they spent more than a million rands, only two gave figures. One repository spent R22 million on archival services while the other spent R5 million.

Table 12: Annual spending for archival programmes

Range of annual spending	No. of repositories	Percentage of all respondents
R50,000 - R99,000	1	11.11
R100,000 - R249,000	1	11.11
R500,000 - R999,000	3	33.33
More than R1,000,000	4	44.44

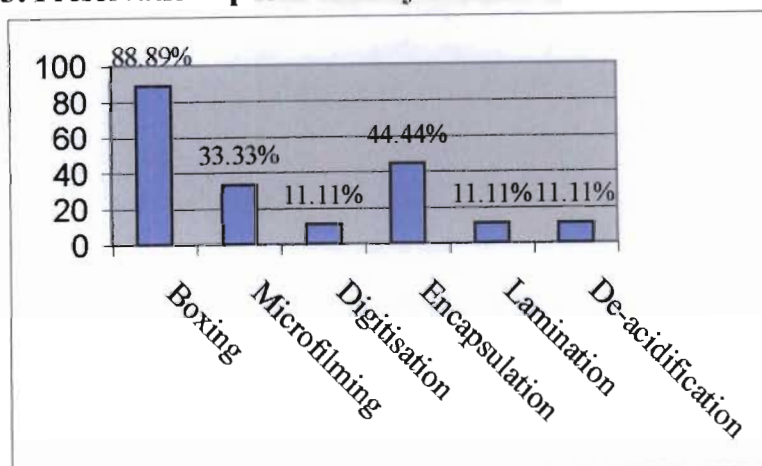
5.1.2.1 Preservation expenditure and facilities

Only a third (33.33%) of the surveyed archival institutions had a specific vote for preservation activities and preservation expenditure as a percentage of the repository's total budget was reported to be between one and four percent. The financial allocations to preservation and conservation of holdings over the past five years have remained unchanged for two archival institutions while one reported an increase.

The treatment and restoration of materials depends on the existence of preservation facilities. Three respondents had in-house conservation facilities. Only one archival repository had a conservation workshop operating at its institution. Direct observation revealed that the infrastructure at the conservation workshop was very rudimentary. The interview at the institution with a conservation workshop employee established that plans are underway to

fully equip the workshop. Three (33.33%) institutions reported that personnel carrying out preservation activities were trained in preservation techniques. Two (22.22%) respondents had a micro-photographic or reprographic unit operating at their institutions. Preservation options used by the surveyed archival institutions are summarized in Figure Five. The percentage values of the preservation options do not add up to 100% because there were multiple responses.

Figure 5: Preservation options used by archival institutions in South Africa



In many countries there are a number of institutions such as libraries, art galleries, museums and research laboratories that are involved in preservation activities. Respondents were asked if they had co-operative preservation activities with any such institutions in South Africa. Two archival institutions co-operated with the National Library of South Africa, National Archives, Records Service of South Africa and the South African Preservation and Paper Conservation Group (SAPCON) at the national level. Information on co-operative preservation with regional and international organisations concerned with the preservation of the documentary materials was also sought. Regionally, one institution co-operated with ESARBICA and JICPA. On the international plane, the same archival repository co-operated with UNESCO, ICA and Northeast Document Conservation Center (NEDCC). No archival institution reported collaboration with research laboratories in South Africa. Table 13 presents a summary of the results.

Table 13: Co-operative preservation activities with national, regional and international institutions

Art galleries in South Africa	Libraries in South Africa	Regional institutions	International institutions	Museums in South Africa	National Institutions
1 (11.11%)	1 (11.11%)	1(11.11%)	1 (11.11%)	2 (22.22%)	2 (22.22%)

Respondents were also asked to rate the overall success of their preservation policies and strategies in achieving their institutions' preservation goals. The results are presented in Table 14.

Table 14: Ranking of the successfulness of preservation programmes

Rank	Frequency	Percent
Moderately successful	2	22.22
Of limited success	4	44.44
Unsuccessful	2	22.22
No opinion	1	11.11
Total	9	99.99

Their answer to the question on the success of their preservation policies and strategies in achieving their institutions' preservation goals was influenced by a number of factors. Of the two archival institutions without archival holdings, one said the preservation policy was not successful and the other did not express an opinion. Of the seven archival institutions with archival holdings, two respondents singled out lack of commitment and limited funding for preservation activities as the major factors that influenced their answer. Five (55.56%) felt that key preservation personnel was lacking. It was also deduced from interviews that in many instances preservation policies were still being developed and had not reached implementation stage. One informant eloquently put it:

Preservation has only been formalized as a section and a lot of planning needs to be done before we start implementing any policies. So success of the strategies cannot be easily measured at the moment although there is a lot of management support at the highest level.

The above statement was corroborated by another informant who said that the post of conservator in the archival repository was only created recently after a work study was undertaken by the provincial government. Otherwise, hitherto conservation and preservation processes never received much attention.

5.1.3 Standards and the preservation of records and archives

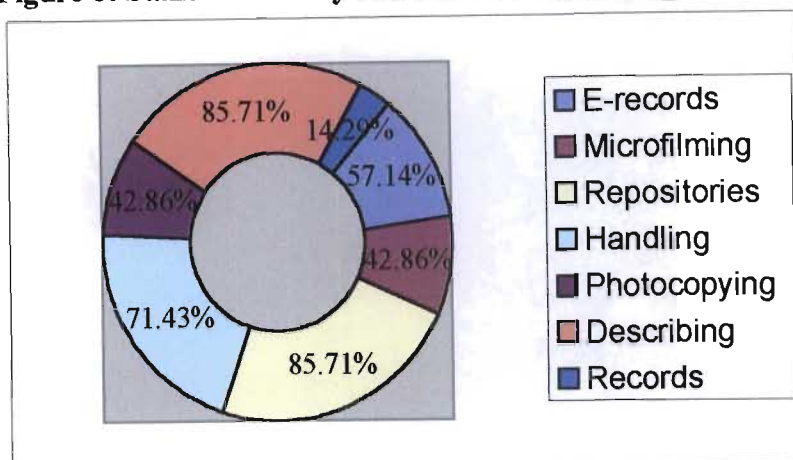
Determining the use of standards in preserving and providing access was important to the study. Standards play an important role in archival practice because of the various formats in which the archives are recorded and the need to exchange and access archival resources. Five (71.43%) of the seven archival repositories reported that they adhered to storage standards.²⁶ Two adhered to preservation and access standards. Only one reported adherence to storage, preservation and access standards. The provincial and national archives legislation was listed as the standards that the repositories adhered to. No regional or international standard was listed.

The Promotion of Access to Information Act was listed as the access standard used by one of the respondents. The surveyed institutions used an in-house standard for describing their archival holdings. The standard they was referred to as the “National Archives Repository Specific Task Manual: STM8 Arrangement and Sorting”. Only three (42.86%) surveyed institutions reported that members of staff were familiar with the standards used for storing, describing and preserving records and archives. It was evident from the interviews that the only standard that was applied consistently was that of describing archives. The standards were not frequently reviewed.

Two institutions said they had influence over the formulation of national standards pertaining to the preservation of archival materials without elaborating. All seven surveyed institutions reported that the National Archives and Records Service of South Africa (NARSA) had established some standards for their institutions. The standards that were widely reported by the respondents are presented in Figure Six and they included standards for describing archives and archival repositories.

²⁶ The number of respondents is seven instead of the nine institutions that participated in the survey because two institutions did not have any archival holdings at the time of the survey.

Figure 6: Standards set by NARSA for archival repositories



One respondent under the category “other” in the relevant question reported standards for records management practices. However, five (71.43%) respondents had established standards for the preservation of records in the hands of the creating departments. Only two respondents elaborated on their answers. Typically, they cited the national archives legislation and the regulations associated with it. Staff of the two archives repositories carried out periodic inspections of government offices to ensure that record keeping standards and guidelines were complied with.

5.1.4 Buildings for the storage of archival materials

Storage conditions offer many opportunities to prolong the life span of documents because they contribute to their physical well being, consequently, the respondents were asked to give some of the main features and location of buildings where archival holdings were stored. Four (57.14%) buildings were constructed to store archival holdings. Buildings at three repositories were adapted to use. The oldest archival repository was built in the 1930s. Two repositories were built between 1988 and 1989. The fourth repository was built in 1995/6. Brick and concrete were the materials mostly used for the structure of the buildings. Concrete was also used for floors in the stack areas. Four repositories reported that they regularly renovated their buildings, however, they did not state the year the buildings were last renovated. Four (57.14%) respondents out of seven reported that the buildings housing archival materials were subject to regular technical maintenance. Only three institutions shared the buildings they used with other tenants. Stack areas were isolated from the other parts of the building in five archival institutions.

Respondents were asked to state the proximity of the buildings to environments that pose preservation problems. No archival building was reportedly located either near an industrial area or close to a river or dam. However, two archival institutions had water pipes close to the records stacks. The other results are summarized in Table 15.

Table 15: Proximity of archival building to hazardous environments

Area with considerable air pollution	Close to the sea	Close to a possible military target	Building located on a spring of water
2	1	1	1

Depending on the architectural design, archival building need to be equipped to deal with various forms of environmental hazards. The following section presents the results pertaining to environmental control.

5.1.5 Temperature and relative humidity in archives repositories

The maintenance of proper temperature and relative humidity (RH) in archives and records storage areas is very important and it is of critical importance in the preservation of documentary materials because inappropriate temperature and RH contribute significantly to the deterioration of materials. Respondents were asked to give details of the strategies they used to control and monitor temperature and RH.

Five out of seven archival institutions had a heating, ventilation and air conditioning (HVAC) system. Respondents did not specify the type of HVAC system they used. Three archival institutions reported that their HVAC system was more than 10 years while two said that it was four to ten years old. The HVAC system was maintained twice a year by two institutions. One archival institution maintained its system annually while the other did it once in two years. One respondent reported that the system was never maintained. The HVAC system was reported to be on at all times at four out the five archival institutions that claimed to have one. It provided constant climate control throughout the year at three of the five archival institutions that reported having one. Incoming air was filtered at four (57.14%) archival institutions.

The average temperature in the archival buildings, repositories and outside the archival buildings ranged from 7°C to 32°C. Table 16 summarizes the results.

Table 16: Average temperature inside and outside the buildings and repositories

Inside the building		Outside the building		In the repository	
Temperature	Frequency	Temperature	Frequency	Temperature	Frequency
10-27°C	1 (11.11%)	27°C	1 (11.11%)	18°C	1 (14.29%)
21°C	1 (11.11%)	28°C	1 (11.11%)	20°C	1 (14.29%)
22°C	1 (11.11%)	7-32°C	1 (11.11%)	21-23°C	2 (28.57%)
23°C	1 (11.11%)	Do not know	6 (66.67%)	25°C	1 (14.29%)
Do not know	5 (55.56%)			Do not know	2 (28.57%) ²⁷
Total	9 (100%)	Total	9 (100%)	Total	7 (100%)

Four (57.14%) out of seven archives repositories that had records in their custody monitored temperature levels in their repositories constantly. On the other hand, only two (28.57%) had controlled temperatures of between 13°C and 21°C in areas where records and archives were stored. Two (28.57%) archival institutions monitored RH levels in their repositories constantly. Two (28.57%) institutions had controlled RH of between 35% and 60% in areas where records and archives were stored. These institutions also reported that they had humidifiers and de-humidifiers when they responded to Question 48 at Appendix Five.

Two (28.57%) of the surveyed archival institutions used environmental monitoring devices in their repositories. The monitoring units were reported to be functioning well. One institution reported that the monitoring units were last calibrated two years ago while the other institution was not aware as to when the units were last calibrated. One institution used a hygrothermograph for measuring relative humidity and another one used a hygrometer. One of the two institutions used a hygrothermograph for measuring temperature in the repository. The interviews conducted with informants from selected archival institutions established that most archivists could afford controlling and monitoring the environment where records were stored

²⁷ Two of the archival institutions that were surveyed do not have repositories to store archival records thus justifying the “do not know” answer.

but, because of lack of awareness and/or because of insufficient funds, did not effectively do so.

5.1.6 Light in records and archives storage areas

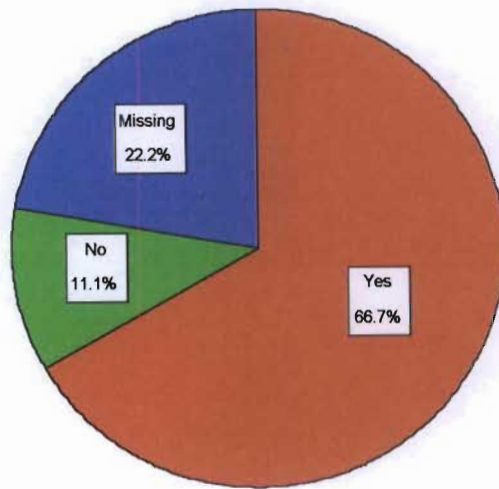
Light accelerates the deterioration of records and archival materials by acting as a catalyst in their oxidation. Respondents were asked about the sources of light in their repository, the length of time that holdings were exposed to light and how they controlled light levels. The major sources of artificial light in archives repositories in South Africa were fluorescent lamps. Six (85.71%) out of seven archives repositories that had records in their custody used them.

All surveyed repositories with the exception of one reported that holdings were exposed to light briefly when records were being retrieved, but site visits to two of the repositories established that there were a lot of inconsistencies between what they reported and what was observed. The researcher spent about eight hours at one site and to the six occasions that the repository where records were stored was checked, the lights were found to be on despite the fact that no one was seen retrieving records or conducting any business in the repository. Only five out of seven repositories control natural light from the windows in their storage areas. No repositories took light level readings.

5.1.7 Pest management in an archival environment

Biological agents such as rodents, termites, silverfish, cockroaches, booklice and beetles are a problem in archival repositories. Respondents were asked how they dealt with pests in their archival institutions. In recognition of the fact that pests either come into the holding on their own or being part of incoming records, respondents were asked if they checked all materials that were to be accessioned before they entered the archives repository. Figure Seven presents the results of the responses. Two (22.2%) of the surveyed institutions did not have any archival holdings. That explains why the third segment in the pie chart contains some missing variables. Only one (11.1%) respondent did not check new accessions before they entered the archives repository. Interviews with some of the respondents revealed that the new accessions were rarely disinfected even if they were checked when they came into the repository.

Figure 7: Checking materials before accessioning them



Only two archival institutions had ever experienced any insect invasion or vermin infestation in the building. It is not surprising that one of the affected institutions was one of those which never checked the incoming deposits for pests. However, the interviewees failed to conclusively establish whether or not incoming deposits were the source of the pests. The respondents carried out routine extermination of vermin infestation in varying frequency rates. The two archival institutions without archival holdings did not control biological infestations. That explains the two missing values that were picked up by the SPSS software package in Table 17. The frequency of extermination of pests ranged from rarely to four times a year as illustrated in Table 17 below.

Table 17: Frequency of exterminating vermin infestations

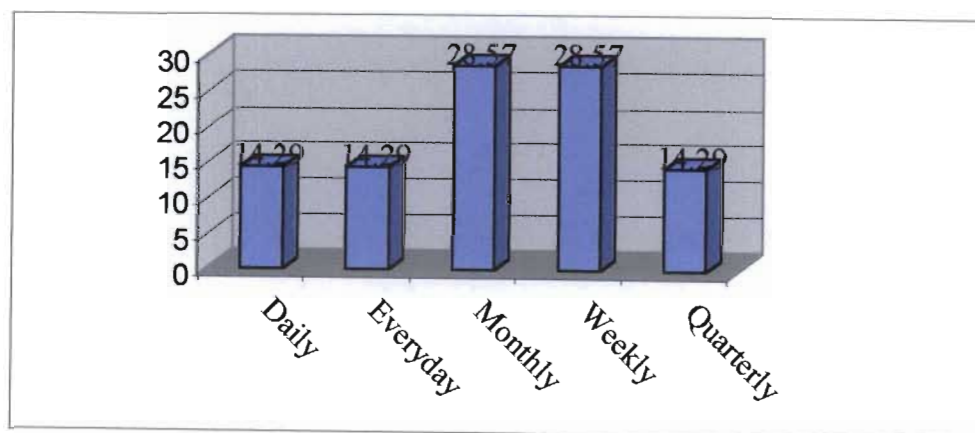
Frequency	Frequency	Percent
Once a year	1	11.11
Twice a year	2	22.22
Rarely	1	11.11
Quarterly	3	33.33
Total	7	77.77
Missing	2	22.22
Total	9	99.99

Spraying (28.57%) and fumigation (71.43%) were the two major methods that respondents used to exterminate pests. Privately contracted companies did the spraying and fumigation. Four respondents saw evidence of pests in spite of treatments. Most respondents did not supply the name of the company that did the treatments. Respondents were asked to state the chemicals used in exterminating and controlling vermin infestations in order to find out if the chemicals that were used did not pose a health hazard. Five respondents did not supply the name of the chemical used in exterminating pests. Three respondents used Dursban®, Rentokil® and Nuvan® respectively. Interviews with some of the respondents established that they did not supply the name of the chemicals used to control pests out of ignorance rather than due to other reasons. Only two of the respondents received a written statement of the findings and work after each treatment cycle. Three respondents received a copy of the label and a material safety data sheet for each pesticide used in their institutions.

5.1.8 Storage and handling

Seen as one of the most basic and effective preservation tools, proper techniques for care and handling of archival materials enjoy universal support from members of the archival profession in public institutions in South Africa. Six out of seven surveyed repositories reported that the storage areas were generally kept clean. The records storage areas were cleaned a varying number of times. Figure Eight presents the frequency of the cleaning. A larger percentage of repositories cleaned the storage area at large intervals.

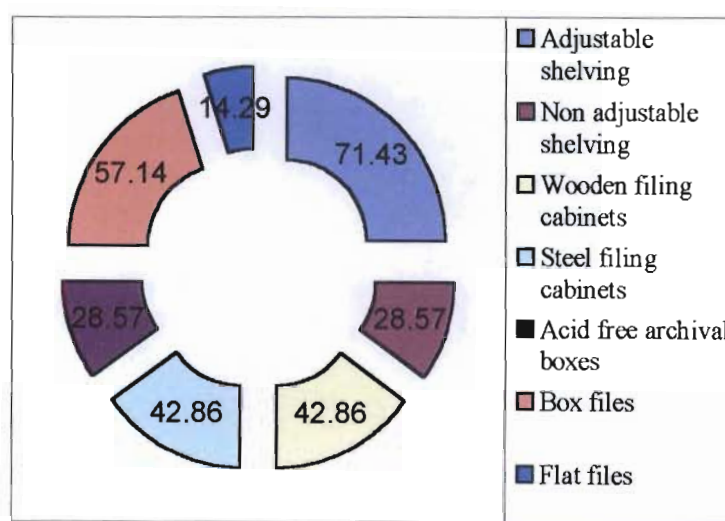
Figure 8: Frequency of cleaning records storage area expressed as a percentage



One repository examined files during handling, two repositories occasionally examined them, one repository never did, and the other three rarely examined them. Three out of seven

archival institutions carried out annual stocktaking of their archival holdings. All surveyed institutions neither tested storage furniture nor archival storage boxes before using them. Although, smoking was not permitted in all the surveyed records offices, there was a lack of “no smoking” signs prominently displayed in the office in four cases. Equally, eating was not permitted in the records office, although only one repository had a “no eating” sign prominently displayed in the office. Records were mostly stored in adjustable metal shelving as illustrated in Figure Nine.

Figure 9: Records and archives storage equipment expressed as a percentage



It was observed during site visits that baked enamel and treated steel were widely used for shelving materials in archival repositories in South Africa. Surprisingly, a very low percentage used acid free archival boxes. Shortage of space was a serious concern expressed by many respondents. Only three out of all the surveyed archival repositories had adequate space for shelving and storage of records and archives. However, five had plans for future expansion of their archival storage space.

Only staff had access to the storage place in six out of the seven repositories that were surveyed. Staff and users had access to the storage place in one repository. Users were trained in the handling of records in four (57.14%) repositories and the same repositories trained staff in the handling of records. They also had written guidelines for handling of documents for staff and the public. All seven archival repositories duplicated or photo-reproduced materials for widespread distribution. Staff in one repository did the photocopying and the users were

responsible for their photocopying in the other six. However, staff determined what could be safely copied in all the surveyed repositories.

5.1.9 Disaster preparedness and security of records and archives

When archivists accept holdings into their repositories, they are taking responsible custody for these materials. All their efforts in relation to acquisition, arrangement, description, and preserving archival materials may come to naught if the archives are lost as a result of a disaster or breach in security. Questions 108 to 158 (see Appendix Five) were asked in order to determine how public records and archives in archival repositories in South Africa were protected from disasters and potential breach of security.

Four archival institutions had written disaster preparedness plans. Respondents were asked to choose from a list the aspects covered by their plans. No other aspect was listed in addition to the options given in the questionnaire. The aspects covered by the plans are summarized in Table 18. Multiple responses were possible in response to the question.

Table 18: Aspects covered by the disaster preparedness plans

Lists emergency supplies	Records	The building	Describes emergency procedures	Outlines disaster response	Safe evacuation of people
0 (0%)	1 (25%)	2 (50%)	2 (50%)	2 (50%)	4(100%)

Out of four respondents who had disaster plans, only one institution had a plan covering natural disasters such as floods. Natural disasters and biological factors such as mould and insects were not covered in any of the reporting institutions' plans. From the listed human-made disasters it was established that the plans of two repositories covered fire and bomb threats and the plan of one repository covered vandalism. The plan of the fourth repository did not cover any human-made disasters. The respondents specified no other possible disasters.

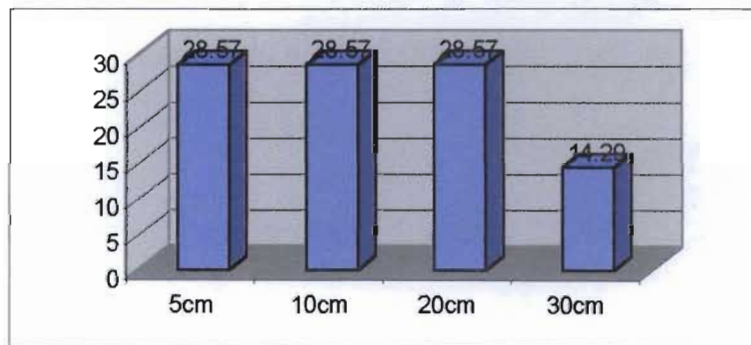
Two repositories tested their disaster preparedness and recovery plans in 2002 and the other two did it within the last two years. Their disaster preparedness and recovery plans were last reviewed in 2001. Three archival repositories had a disaster planning team in place. The same institutions had a chain of command to deal with a disaster. Interviews with some of the respondents revealed that most of the contingency plans were for the safety of staff and users.

That partly explains why most of the plans did not cover the records as demonstrated in Table 18. One respondent stated that they were currently working on formulating a disaster plan for records and archives. Only one had a duplicate inventory for its holdings and it was kept in the office of the archivist on the same premises.

Although staff had been instructed in emergency planning in three repositories the respondents did not elaborate on their answers. Interviews with one of the repository staff established that the instruction was very rudimentary. Two institutions have trained staff in emergency recovery procedures.

The distance between the floor and the place where records were stored varied from repository to repository. Figure 10 shows the pattern that emerges from the findings.

Figure 10: Distance of records from the floor expressed as a percentage



The likelihood of a disaster caused by water was high in four repositories where water-bearing pipes were between two and four metres from the storage areas. One repository reported that it was located on a spring of water. There was no archival repository that shared salvage and recovery supplies with other cultural heritage institutions in South Africa. Three institutions carried out simulated disaster drills. Two repositories had alternative sources of electric power like a generator.

Five (71.43%) repositories had a fire detection system in the area where records were stored. Only one respondent was able to state the type of fire detection system in place, namely, the Ziton fire alarm system. The researcher assumed that some of the respondents did not know the type of fire detection systems in their repositories. Indeed some interviews with some of the respondents confirmed the point. The fire detection systems were connected to a central

monitoring facility in five repositories. Three respondents reported that the fire detection systems were connected to the local fire department. In the remaining two cases, one respondent stated that the system was connected to the Public Works Department and the other mentioned the control board in the security office.

Two (28.57%) archival institutions had regular visits by their local fire department. The purposes of the visits were to carry out inspections and staff training. One of the archival institutions had made the fire department aware of the records that were to be saved in the event of a disaster. The same archival institution had made the fire department aware of the special procedures for dealing with special collections and formats. Fire extinguishers were available throughout the repository in six (85.71%) archival institutions. Carbon dioxide fire extinguishers, with a percentage of 85.71%, were by far the most used in archival repositories in South Africa. One respondent used a multipurpose extinguisher. The extinguishers were inspected annually in all the surveyed repositories.

Staff had been trained to use fire extinguishers in five archival institutions, but one of the institutions did not specify who did the training. The training was done by the local fire department in two institutions and the other two did the training in-house. Four institutions have a sprinkler system in the building. They commonly use the wet pipe systems. The fire suppression systems were tested the year prior to the present survey. Only two respondents stated that an external company tested the systems.

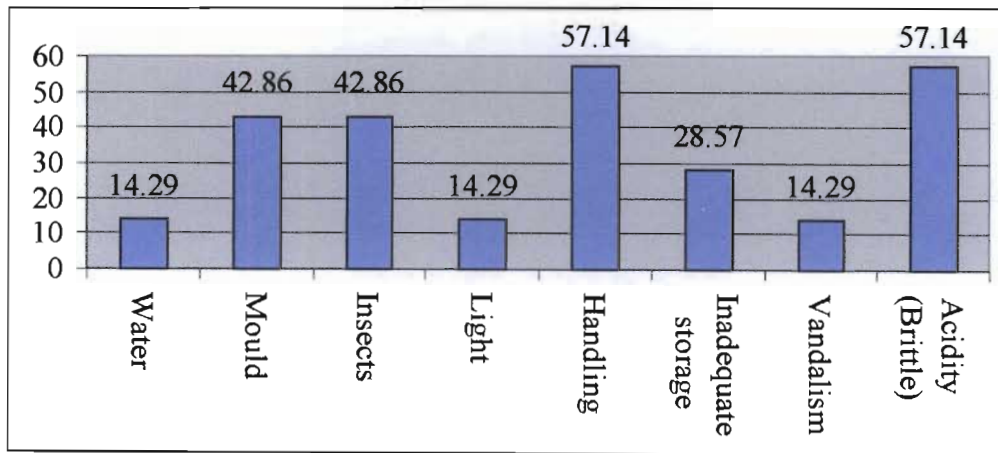
All the six archival repositories that had custody of public record archives employed security personnel. Two institutions also had closed circuit television cameras (CCTV). No archival institution reported the existence of an intruder alarm system in its repository. Access points to the archival buildings varied from one to five. A few selected staff members and security guards had the keys to the building. The storage places for records had windows in two institutions and they were all barred.

5.1.10 State of records and archives in general

Holdings surveys are key to identifying the state of archival records and possible remedial action. Three archival institutions had carried out a holdings survey of the majority of their

archives to identify potential preservation problems within the past two years. Figure 11 presents the form of damage to records and archives caused by various factors that the respondents observed in their repositories. Acidity and handling were at equilibrium in relation to the damage that they caused to records. Insects and moulds were the next in the hierarchy with a percentage of 42.86 each.

Figure 11: Damage caused to records expressed as a percentage



Six (85.71%) out of the seven institutions that participated in the survey had observed deterioration of documents resulting from the use by the public. Two institutions ascribed the deterioration to photocopying and the other institution that responded to the question attributed it to inadequate supervision of the users. Three (42.86%) surveyed institutions carried out conservation treatment in-house and one of the institutions sent its materials to the national archives headquarters in Pretoria. The overall condition of archival holdings was good in two (28.57%) repositories, average in three (42.86%) and unsatisfactory in two (28.57%). The classes of records that were in particularly poor condition are summarized in Table 19.

Table 19: Classes of records in particularly poor condition

Classes of records	Frequency	Percent
Estate papers of the Master of the High Court	3	42.86
Former Department of Health and Welfare papers	1	14.29
Older and heavily used items	1	14.29
Paper-based records	1	14.29
Ships lists (Indian immigration)	1	14.29
Total	7	100.02

To ascertain the respondents' perceptions about the general conditions of their records and archives, they were further asked their degree of agreement with certain physical conditions of records on a Likert scale and the raw scores are summarized in Table 20.

Table 20: General physical condition of records and archives in archival institutions

Condition of records	Strongly agree	Agree	Strongly disagree	Disagree	Undecided
They are dirty (soiled, stained)	1	2		4	0
Deteriorating through wear and tear	3	2		2	0
Condition of paper is poor (acidic and brittle)	2	3		2	0
Condition of photographs is bad		1	1	5	0
The condition of audiovisual materials (films and tapes, etc.) is poor				3	1
The condition of electronic records is poor			1		2
Condition of records generally poor because of mould attack	2	2	2		1

Table 20 presents the raw scores on the attitude and perceptions of the respondents towards the physical condition of their records. Using the Likert or summated scales respondents were asked to indicate their attitude towards the condition of their records in terms of five degrees of agreement and disagreement. Each point on the scale carries a score. Responses indicating the least favourable degree of agreement in relation to the deterioration of records were assigned the least score (1) and the most favourable was given the highest score (5). The scale value for each level of response were assigned as: strongly agree = 5, agree = 4, undecided = 3, disagree = 2 and strongly disagree = 1 as indicated in the second to the fifth column of Table 21. The raw scores presented in Table 20 were computed to yield a total score for the attitude of the respondents to each attribute. Attitudes of respondents to the condition of electronic records and audiovisual formats were excluded because the data was not sufficient and not easily comparable.

Table 21: Summated scales on the attitude of the respondents towards the condition of their records and archives

Condition of records	Strongly agree	Agree	Undecided	Disagree	Strongly disagree	Cumulative Score
	5	4	3	2	1	
They are dirty (soiled, stained)	5	8	0	8	0	21
Deteriorating through wear and tear	15	8	0	4	0	27
Condition of paper is poor (acidic and brittle)	10	12	0	4	0	26
Condition of photographs is bad		4	0	10	5	19
Condition of records generally poor because of mould attack	10	8	3	0	2	23

With a total of seven respondents the following scores were revealing:

- $7 \times 5 = 35$: strongly agree that records were deteriorating
- $7 \times 3 = 21$: a neutral attitude
- $7 \times 1 = 7$: strongly disagree that physical condition of records was poor

That means that the cumulative score for any attribute would fall between seven and thirty-five. If the score happens to be above 21 it shows that the physical condition of records would be bad and a score below 21 demonstrates that the physical condition of records is not at all poor while a score of exactly 21 would be suggestive of a neutral attitude. The fact that records deterioration due to wear and tear, acidity of paper and mould attack had cumulative scores above 21 is notable.

The survey data revealed that three institutions did not carry out any conservation treatment activities. Three archival institutions microfilmed their holdings and one carried out document conservation and repair during the past year either in-house or through an outside contractor. Interviews established that most of the microfilming of archival materials in South Africa is

out-sourced to outside contractors. Conservation work involved encapsulation of items (especially maps with archival polyester). One respondent stated that they had not carried out any conservation treatment because they were still in the process of identifying material for conservation and investigating the utility of reformatting strategies.

Four archival institutions used microfilm for preservation purposes. Contracted companies filmed materials on a project basis. One surveyed archival institution had in-house microfilming facilities with one camera. The 16mm film format was commonly used. One staff member was reportedly employed for microfilming. Interviews established that the staff member concerned was also involved in a myriad of other reprographic activities such as photocopying and developing photographs. Records that were deteriorating and heavily used items were selected for microfilming.

5.2 INFORMATION TECHNOLOGY AND THE PRESERVATION OF RECORDS AND ARCHIVES IN SOUTH AFRICA

There are significant challenges to preserving records and archives created by the use of information technology as compared with paper. Respondents were asked several questions to establish how they were managing electronic records (e-records) that resulted from the use of information technology, particularly computers. Five (71.43%) institutions out of the seven archival repositories in the custody of documentary materials had written policies for managing digital materials. They used guidelines for managing electronic records issued by the National Archives and Records Service of South Africa. Interviews and documentary analysis established that the guidelines were issued in 2000 and the interviews confirmed that they were in the process of being updated.²⁸ At the time of writing, copies of the guidelines were only available as hard copy publications (National Archives of South Africa 2000b).

However, only three out of the five responding institutions claimed that the policy provided guidelines for acquiring materials in digital form, storage and migration, and two of the three respondents said they provided for refreshing e-records. In addition, one of the two

²⁸ According to one informant the updated guidelines will be loaded on 2 April 2003 onto the NARSA website at: <http://www.national.archives.gov.za/>. The guidelines were not yet available as of 3 July 2003.

respondents stated that the guidelines provided for converting materials from print to digital. Two of the three archival institutions stated that the policy satisfactorily met their institutions' current needs and one said the policy was inadequate. However, no participating archival institution had agreed standards or guidelines for the long-term preservation of records that were created electronically.

Having established their policies on the management of electronic records, respondents were asked to give information on their current holdings and storage methods and formats. Only three archival institutions had digital materials in their holdings for which they assumed responsibility for preservation. They also accepted electronic records in any format. No surveyed archival institutions had currently created digital materials as a result of digital conversion projects or by any other conversion methods.

Only one (33.33%) archival institution had dedicated hardware or software systems for the long-term preservation of electronically created records, however, the respondent did not specify the formats the archival institution used. The formats present in the digital holdings for which the respondents assumed preservation responsibility were flat ASCII files, database format, spreadsheet format, image format, and moving images for one respondent. On the other hand, two respondents had formats such as text files with mark-up and audio. Electronic records were stored as received in two archival institutions. In addition, one of the archival institutions transferred records to other digital storage medium such as the hard drive.

The oldest digital materials in one of the two archival institutions were written on the current storage medium in 1990. The other respondent did not know the details of the dates when the records were written in the current storage medium. Both respondents did not state the current storage medium and format of their oldest electronic records.

Two (66.67%) institutions had digital materials in their holdings for which they lacked the operational and/or technical capacity to mount, read, and access. They had problems accessing information on some magnetic tapes. No archival institution had an established method for preserving digital materials. One institution stated that it refreshed digital materials, but

neither described the frequency nor method of refreshing. It seems that migration of digital materials was not done by any of the participating institutions.

All surveyed institutions could not estimate the quantity of digital materials for which they currently had preservation responsibility. Two archival repositories did rank threats to their electronic records as summarized in Table 22. One archival institution specified a lack of interest in preservation as an additional threat. Technological obsolescence and insufficient resources for preservation were on top of the list of the threats to e-records.

Table 22: Ranking of factors that were regarded as threats to digital materials at archival institutions within the next five years

Threats to the loss of digital materials	Greatest threat	Moderate threat	Neutral	Smallest threat	No threat
Physical condition	0	1	0	0	1
Technological obsolescence	2	0	0	0	0
Insufficient policy or plan for preservation	0	1	0	1	0
Insufficient resources for preservation	2	0	0	0	0
Insufficient interest among policy makers	1	1	0	0	0

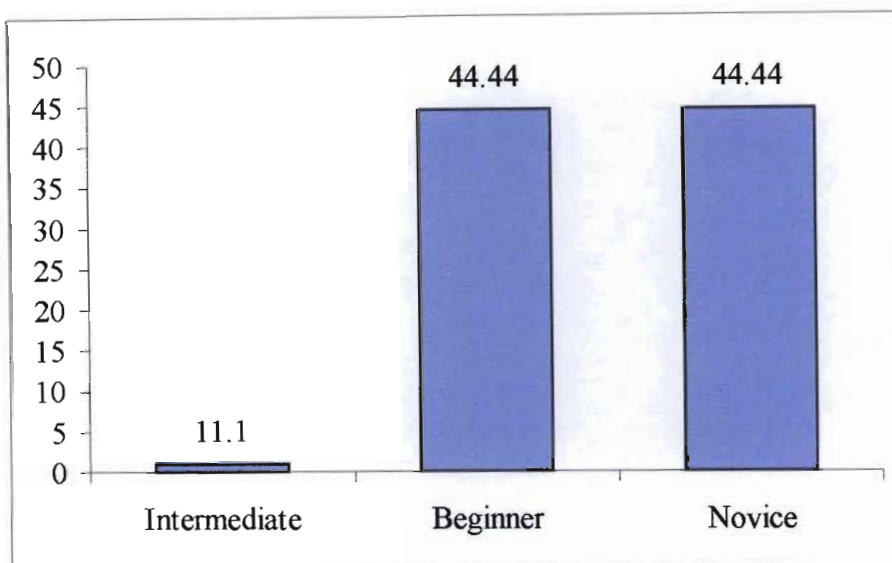
All the seven institutions that had archival holdings planned to increase the level of staff expertise with digital preservation. Interviews established that two of the surveyed institutions that did not have archival materials were also harbouring the same plans in terms of staff development. The methods they planned to use in the next three years to increase the level of staff expertise with digital preservation are presented in Table 23. Local courses in digital preservation appear to be the most favoured means of increasing expertise in the management of e-records.

Table 23: Intended methods of enhancing staff expertise in digital preservation

Method of enhancing expertise in digital preservation	Total	Percentage of all respondents
Local courses in computer or digital technology	7	77.78
Training provided by professional organizations	6	66.67
Independent study/assessment	4	44.44
Hiring staff with digital knowledge or experience	4	44.44

The highest level of in-house knowledge available in all the nine surveyed archival institutions for digital preservation activities ranged from novice to intermediate as summarized in Figure Twelve.

Figure 12: Available knowledge of digital preservation expressed as percentage



5.3 LEVEL OF SKILLS AND KNOWLEDGE IN PRESERVING RECORDS AND ARCHIVES AND MAKING THEM AVAILABLE FOR USE

Skills and knowledge of preservation techniques and procedures are fundamental to implementing preservation activities. Question 198 asked about the characteristics of staff employed in the preservation and conservation of public records and archives in archival institutions in South Africa. Among them the nine institutions that were surveyed employed 199 staff members. Table 24 summarizes the categories of qualifications that staff employed

in the archival institutions have. The categories of staff were not mutually exclusive and an overlap between the categories was possible.

Table 24: Categories and qualification of staff employed in the preservation and conservation of public records and archives in South Africa

Category and qualification of staff	Total	Percentage
Staff directly involved in preservation and conservation activities	21	10.55
Number trained abroad	10	5.03
Number trained in South Africa	189	94.97
Number with technical training	19	9.55
Number with academic training	50	25.13
Number with the highest qualification as Std 10	42	21.11
Number with the highest qualification as Std 12	22	11.06
Number with the highest qualification as a Certificate in archives or records	9	4.52
Number with the highest qualification as a Diploma in archives or records	7	3.52
Number with the highest qualification as a bachelor's degree without archives studies	31	15.58
Number with the highest qualification as a bachelor's plus archival diploma or certificate	20	10.05
Number with the highest qualification as a Masters in an archival related discipline	6	3.02
Number with the highest qualification as a PhD in an archival related discipline	1	0.50
Number with training in deacidification	5	2.51
Number with training in microfilming	1	0.50
Number with training in digital preservation	7	3.52
Number with training in developing conservation-restoration programmes or surveys	5	2.51
Number with training in providing advice and technical assistance for conservation-restoration of cultural property	4	2.01
Number with training in developing and implementing preventive and handling procedures	4	2.01
Number with training in evaluating conservation problems in context	6	3.02

Further analysis of data in Table 24 shows that most of the 21 staff members who are directly involved in preservation and conservation activities might not have been trained in major conservation processes. The picture that emerges from the data that is extracted from Table 24 is portrayed in Table 25. Seven (33.33%) have training in digital preservation as compared with a mere 4.76% with training in microfilming. Using figures from Table 25, the mean score

of personnel directly involved in preservation and conservation activities in South Africa was found to be one and half. Thus, the number of personnel dealing with microfilming was below average.

Table 25: Type of training for personnel directly involved in preservation and conservation activities

Type of training	Total	Percentage
Number with training in deacidification	5	23.81
Number with training in microfilming	1	4.76
Number with training in digital preservation	7	33.33
Number with training in developing conservation-restoration programmes or surveys	5	23.81
Number with training in providing advice and technical assistance for conservation-restoration of cultural property	4	19.05
Number with training in developing and implementing preventive and handling procedures	4	19.05
Number with training in evaluating conservation problems in context	6	29.57

Three (33.33%) out of the nine surveyed archival institutions conducted in-service training in preservation and conservation. Two archival institutions relied on hands on demonstrations and workshops to provide in-house training. The third institution stated that experts from outside the archives did the training through workshops. Table 23 showed that archival institutions are inclined towards training their own staff as opposed to hiring staff with knowledge and experience.

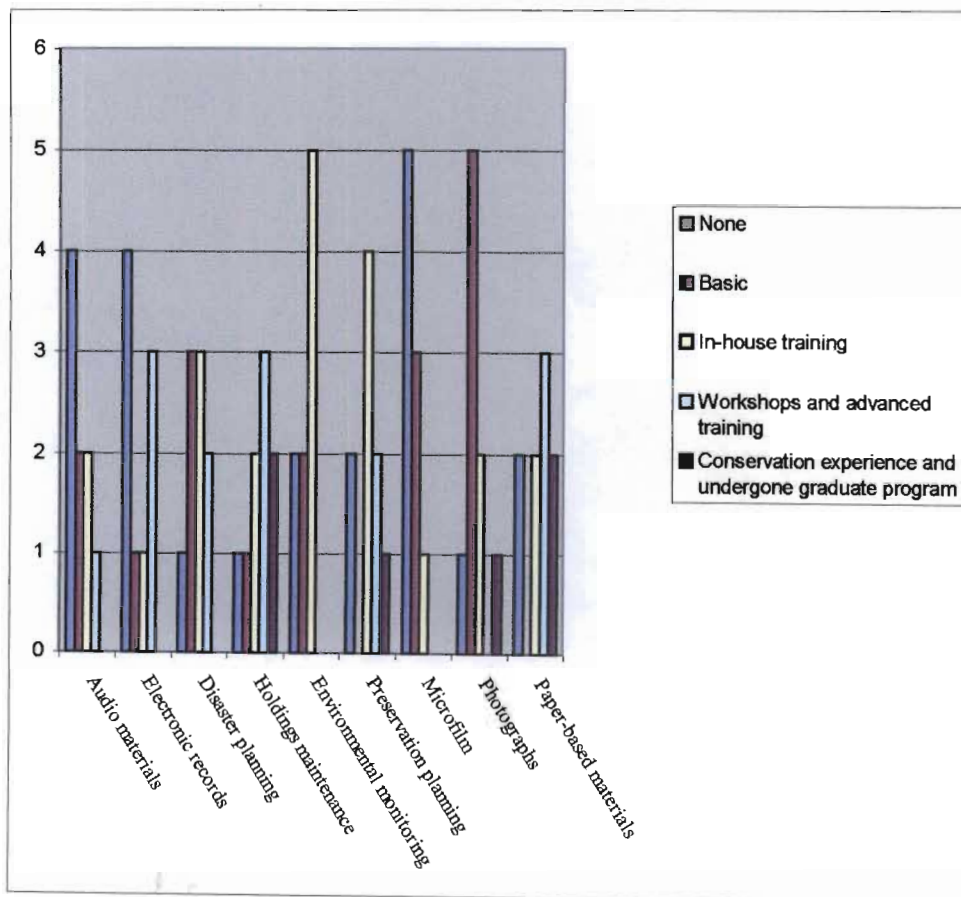
The respondents were also asked their level of expertise in various aspects of preservation and conservation and the raw scores and the visual pattern that emerges from the data are presented in Table 26 and Figure 13 respectively. It is evident that expertise in preserving e-records and microfilming was ranked very low as compared to other formats such as paper.

Table 26: Expertise in dealing with some selected preservation activities

Area of expertise in preservation	Raw scores					Rank
	0	1	2	3	4	
Audio materials	4	2	2	1		1.00
Electronic records	4	1	1	3		0.67
Disaster planning and recovery	1	3	3	2		1.67
Holdings maintenance	1	1	2	3	2	1.56
Environmental monitoring	2	2	5			1.33
Preservation planning	2		4	2	1	1.78
Microfilm	5	3	1			0.67
Photographs	1	5	2		1	1.44
Paper-based materials	2		2	3	2	2.33

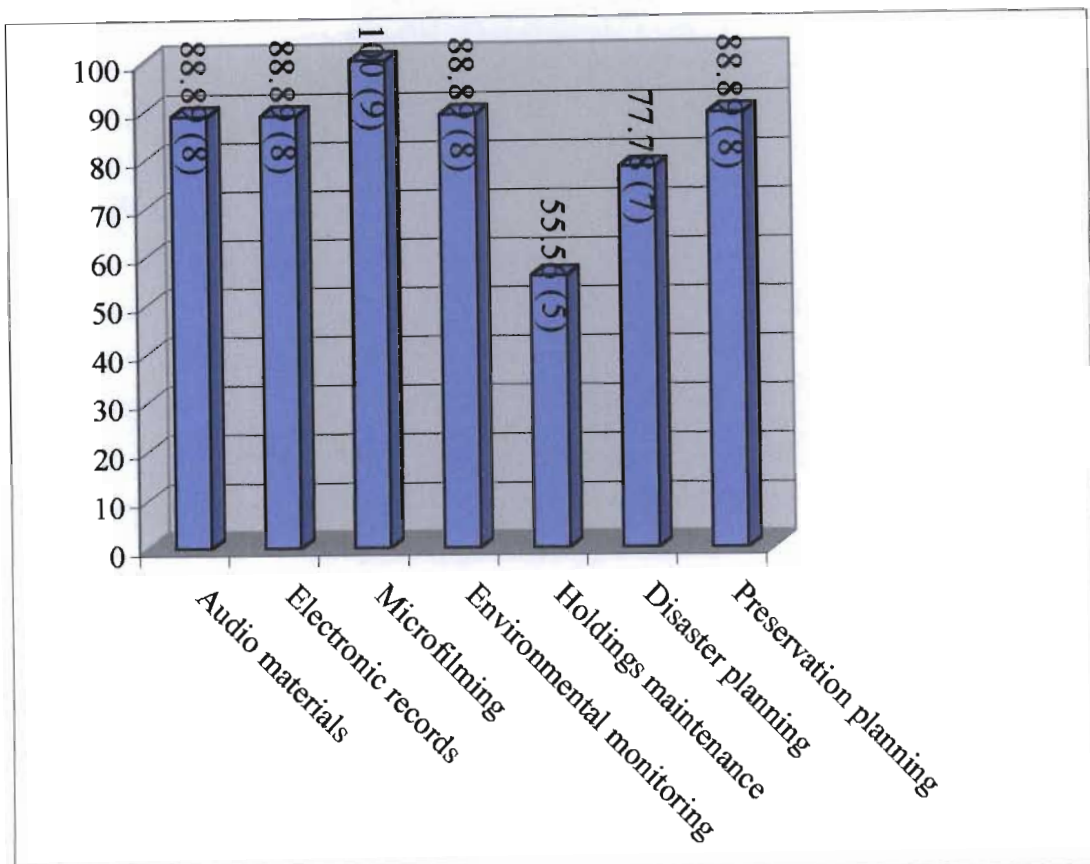
Legend of the Table: 0= none; 1= basic; 2= in-house training, reading, some workshops; 3= in-depth workshops and advanced training; 4= conservation experience and have undergone graduate programme.

Figure 13: Level of expertise in dealing with selected preservation activities



The respondents were also asked to select from a list the areas in which they felt they needed additional training. There was provision for the respondents to specify any additional training that was not listed in the questionnaire. Training in microfilming was heavily required by the respondents. Figure 14 summarizes the results on the additional training needed by the respondents.

Figure 14: Additional training needs identified by respondents expressed as a percentage

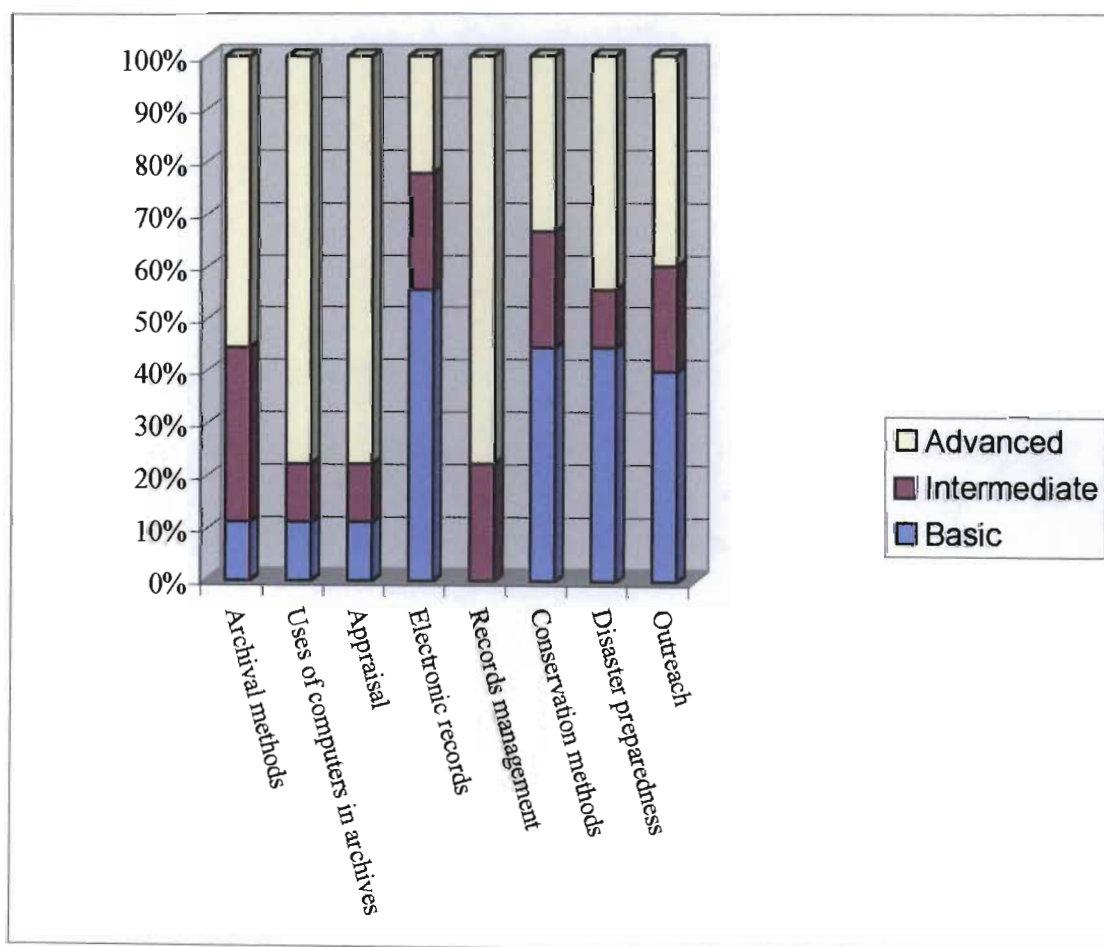


The respondents were further asked the areas where they had the greatest need for additional training and the level they required it as well as their preferred methods for receiving that additional training. It is noteworthy that training in electronic records, preservation and disaster preparedness was mostly required at a basic level. The other raw scores are summarized in Tables 27 and 28. On the other hand, Figures 15 and 16 presents the visual patterns of the data respectively. For instance, the first bar in Figure 15 shows that 10% of the respondents needed training in archival methods at a basic level, 30% needed it at an intermediate stage and 70% needed training at an advanced level.

Table 27: Level of additional training needed by staff at responding archival institutions

Required additional training	Level		
	Basic	Intermediate	Advanced
Archival methods	1	3	5
Uses of computers in archives	1	1	7
Appraisal and collection development	1	1	7
Electronic records	5	2	2
Records management	0	2	7
Preservation/conservation methods	4	2	3
Disaster preparedness	4	1	4
Public relations/outreach	3	2	4

Figure 15: Level of additional training needed by staff expressed as a percentage

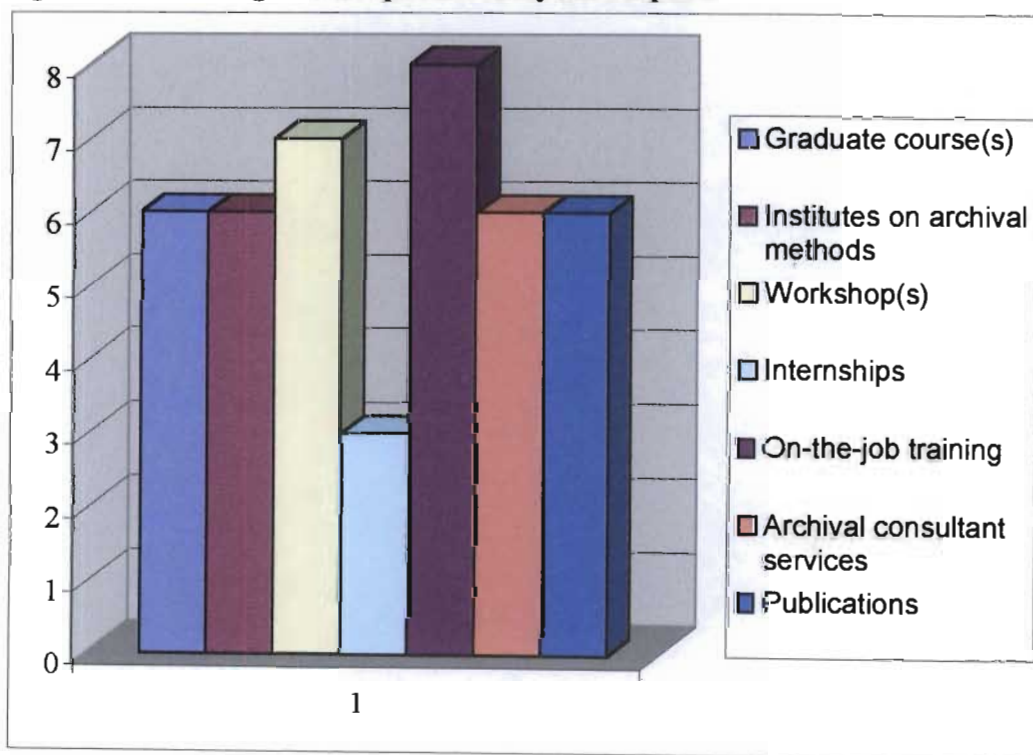


When it came to the best methods of getting additional training, most respondents favoured on-the-job training. Internships were very unpopular as shown in Table 28.

Table 28: Best methods for receiving additional training cited by the respondents

Preferred training method	Total	Percentage
On-the-job training	8	88.89
Workshop(s) on archival techniques (1-2 days)	7	77.78
Graduate course(s) in archival administration	6	66.67
Institutes on archival methods/techniques (1-2 weeks)	6	66.67
Publications, printed training manuals	6	66.67
Archival consultant services	6	66.67
Internships	3	33.33

Figure 16: Training method preferred by the respondents



Surveyed archival institutions neither conducted research relating to conservation and restoration nor disseminated information gained from examination, treatment or research on the preservation of records and archives.

5.4 ACCESS TO INFORMATION CONTAINED IN RECORDS AND ARCHIVES

Accessible public records and archives are key to efficient research, protecting peoples' rights, accountable and transparent governance and efficient administration. Repositories may have wonderful collections of records and archives, but without access tools such as inventories,

indexes and catalogues, the holdings are no more than piles of unusable materials. In addition to developing finding aids, archival repositories should be engaged in outreach activities in order to make users aware of what they have in their holdings. The following sections present data that was collected pertaining to access to public records and archives in South Africa in relation to finding aids, users and accessibility of records, public programming, priorities for improving the management of records and archives and making them available for use and the potential impact of information technology on accessing records and archives.

5.4.1 Access tools and finding aids

All records and archives were open to use in three out of the seven institutions that had archival holdings. Some records and archives were not open for use in four archival institutions. Three of the four institutions that had some records closed to the public reported that the records that were not accessible were less than twenty years old and governed by the closed periods stipulated in the archival legislation of some of the archival institutions in South Africa. The fourth institution reported that some sensitive and classified documents were not open to the public. Users were made aware of their access rights and their responsibility to comply with the policies and regulations governing the use of archival holdings in six (85.72%) out of the seven participating archival institutions. Four (57.14%) archival institutions analysed users' interests and needs at regular intervals, and adjusted policies and practices accordingly.

The surveyed institutions used a variety of finding aids to make archives accessible to the public. The tools used to facilitate access to public archives and records are summarized in Table 29.

Table 29: Tools used to locate descriptions of records and archives

Type of finding aid	Number using tool	Percentage
Word processed register/inventory	7	100
Card catalogue	5	71.42
Computer catalogue accessible remotely	4	57.14
Printed guide to whole collection	4	57.14
Computer catalogue accessible in-house	3	42.86
World Wide Web site	1	14.29

One archival institution reported that less than 25% of its records and archives were described in one or more of the finding aids listed in Table 29. Three (42.86%) respondents had 50% to

74% of their records and archives described in the finding aids. The remaining three institutions had between 75% and 100% of their records and archives described in these finding aids. The respondents were also given an opportunity to state the impediments they thought hindered access to their records and archives. Table 30 summarizes the results.

Table 30: Significant impediments to the use of records and archives

Type of impediment	Number reporting the problem	Percentage
Records have deteriorated beyond use	3	42.86
Necessary equipment not available	2	28.57
Cannot physically locate them	1	14.29
Lack of indexes or other finding aids	1	14.29
Processing backlog	1	14.29

Interviews revealed that some of the records and archives had deteriorated beyond use because of the factors portrayed in Figure 11, namely, frequent handling, insects, mould and acidity of paper. Lack of equipment such as microfilm readers and tape players were cited as some of the impediments to accessing information contained in public records and archives. There was a designated reading room provided for consulting archival materials onsite at five (71.43%) out of the seven archival repositories that had archival holdings in their custody.

5.4.2 Users and the accessibility of records and archives

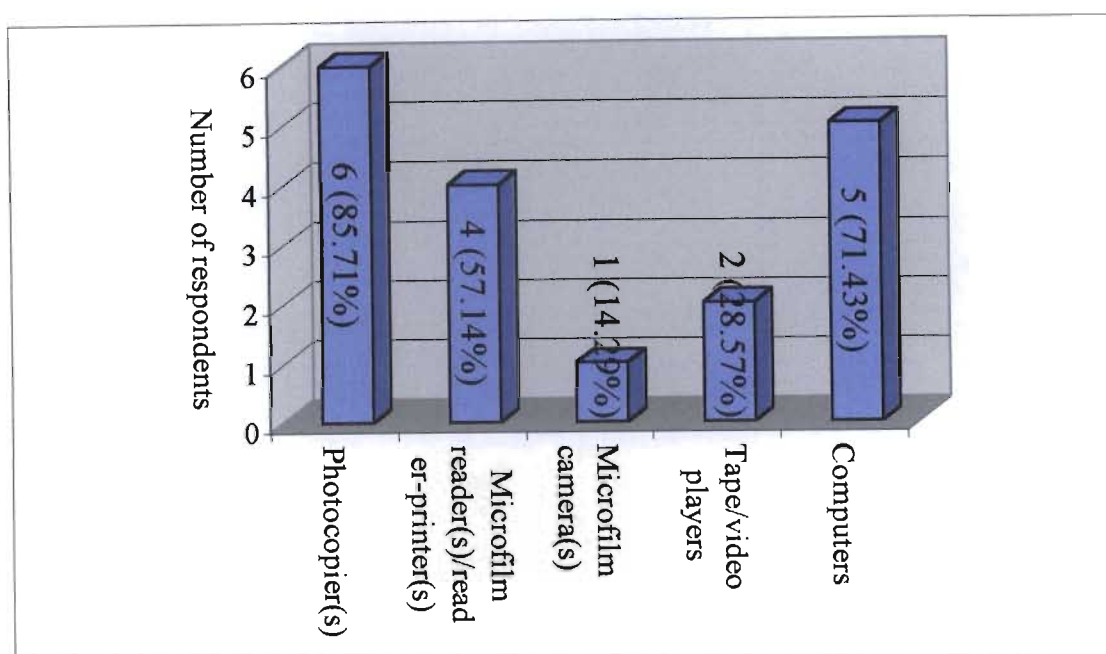
Collectively, the surveyed archival repositories handled close to 24 470 reference requests per year. Table 31 summarizes the results. The requests came largely via in-personal visits to the repositories, followed by telephone inquiries. It is evident that electronic mail is beginning to make inroads into more traditional research methods.

Table 31: Number of research requests received each year by all repositories

Category	Total number reported by all respondents	
	Total	Percentage of all requests
Personal visits	13930	56.93
By telephone	6632	27.10
Electronic mail	2846	11.63
Regular mail	1062	4.34
Total reference requests	24470	100.00

Equipment plays a key role in making archives and records accessible. Respondents were asked to state the equipment they had at their disposal for use in managing or making their records and archives available. Multiple responses were possible in this question. Results are presented in Figure 17.

Figure 17: Equipment for making records and archives accessible



Four (57.14%) out of the seven archival repositories had sufficient physical and technical equipment to facilitate easy and safe access to all types of records they held. The three archival institutions that did not have the equipment did not elaborate on the deficiency as required by the measuring instrument. Three (48.86%) of the participating institutions communicated to users the processes for requesting special access to restricted materials.

Staff providing access to records and archives was fully trained for their jobs in five (71.43%) out of the seven archival institutions with archival holdings. Access facilities were reported to be adequate for the physically challenged (disabled) at five institutions. There were established standards governing the quality of service provided by six (85.71%) archival institutions. Users were said to be aware of their obligation to comply with copyright legislation and access conditions when using information contained in records and archives at five archival institutions. The archival institutions used notices posted next to the photocopying machines to make users aware of their obligations. One archival institution had notices and regulations available at all tables in the reading room.

Citation guidelines and processes for permission to publish information from records and archives were communicated to users at four (57.14%) archival institutions. The institutions

did not elaborate on their answers. However, some observations made at two of the institutions showed that such guidelines were nonexistent. Reprographic processes like microfilming and photocopying were reportedly controlled to minimize damage to records at five (71.43%) archival repositories. In addition, reprographic processes were not undertaken at those five institutions if they endangered the records.

Reading room rules and handling guidelines were communicated to the users at six (85.71%) archival institutions. Three of the institutions communicated them in writing, three did it verbally, and the sixth institution did it both in writing and verbally. The guidelines were communicated to the users briefly during use at four (57.14%) archival institutions while three (42.86%) did it briefly before use. All the institutions claimed that researchers consulted records under constant supervision by staff, but some instances were noted during observation at two of the surveyed institutions when researchers were left unattended.

5.4.3 Public programming

Before looking at various strategies of promoting access to records and archives in South Africa, a footnote on the patterns of use of archival documents in the southern African region is appropriate. It is important to find out whether or not the number of users of records and archives is growing and perhaps make comparison with regional trends, whenever statistics are available. The total number of reading room visitors to NARSA for the period 1997 to 2000 is given in Table Six in Chapter Three. Table 31 gives estimated figures for 2001 based on the data that was collected for the present study. Table 32 gives a comparative picture of personal visits by researchers to the reading rooms of archival institutions in Botswana, Malawi, South Africa, Swaziland and Zimbabwe.

The figures in Table 32 show a phenomenal growth in the number of people visiting archives in South Africa as opposed to Botswana, Malawi, Swaziland and Zimbabwe. The 2001 figures in Botswana show a negative growth, whereas the visitors to the reading rooms of Malawi, and Zimbabwe tended to fluctuate. Swaziland registered a steady growth of visitors. In contrast, in the year 2001 the figures in South Africa grew threefold at the national level while the figure for the national archives repository was close to seven times more than in the year

2000. How can the increase over time in the number of users of archival facilities in South Africa be explained? Does the answer lie in their public programming activities?

Table 32: Comparisons of trends of visitors to reading rooms in Botswana, Malawi, Swaziland, Zimbabwe and South Africa

Visit to the archive facility	Visitors 1998	Visitors 1999	Visitors 2000	Visitors 2001
South Africa (including Pretoria)	5614	5190 (-8%)	5509 (+6%)	13930 (+153%)
National Archives Repository (Pretoria)	850	959 (-12.82%)	410 (-57.25%)	2850 (+595%)
Botswana	4282	3279 (-23.42%)	2034 (-37.97%)	1342 (-0.34%) ²⁹
Malawi	163	135 (-17.18%)	114 (-15.56%)	124 (+8.77%) ³⁰
Swaziland	163	389 (+138.65%)	429 (+10.28%)	516 (+20.28%) ³¹
Zimbabwe	4586	2292 (-50%)	4020 (+75%)	4088 (+2%) ³²

Publicity campaigns and public relations exercises are some of the strategies used to influence the public's use of archives and records. Respondents were asked questions that sought information about their public programming activities. Respondents also provided additional strategies they used in public programming. The participating institutions frequently mentioned conducted tours and group visits as some of the strategies they used in their outreach programmes. Some of the results are presented in Table 33. However, only one out of the seven archival institutions that were surveyed had a written public programming plan.

Table 33: Strategies used in public programming activities

Strategy	Total	Percentage using strategy
Group visits and conducted tours	6	85.71
Workshops and seminars	5	71.43
Exhibitions	5	71.43
Brochures	3	42.86
Public lectures	3	42.86
Print media	1	14.29
Fliers	1	14.29
Publications	1	14.29
Newsletters	1	14.29

²⁹ Data for Botswana was obtained from Akhaabi (2003).

³⁰ Data for Malawi was from Lihoma (2003).

³¹ Data from Swaziland was obtained from the National Archives of Swaziland (2003).

³² Data for Zimbabwe was collected from National Archives of Zimbabwe (1997-2001). The figures in brackets denote negative and positive percentage increase in the number of visitors.

5.4.4 Priorities for improving the management of records and archives and making them available for use

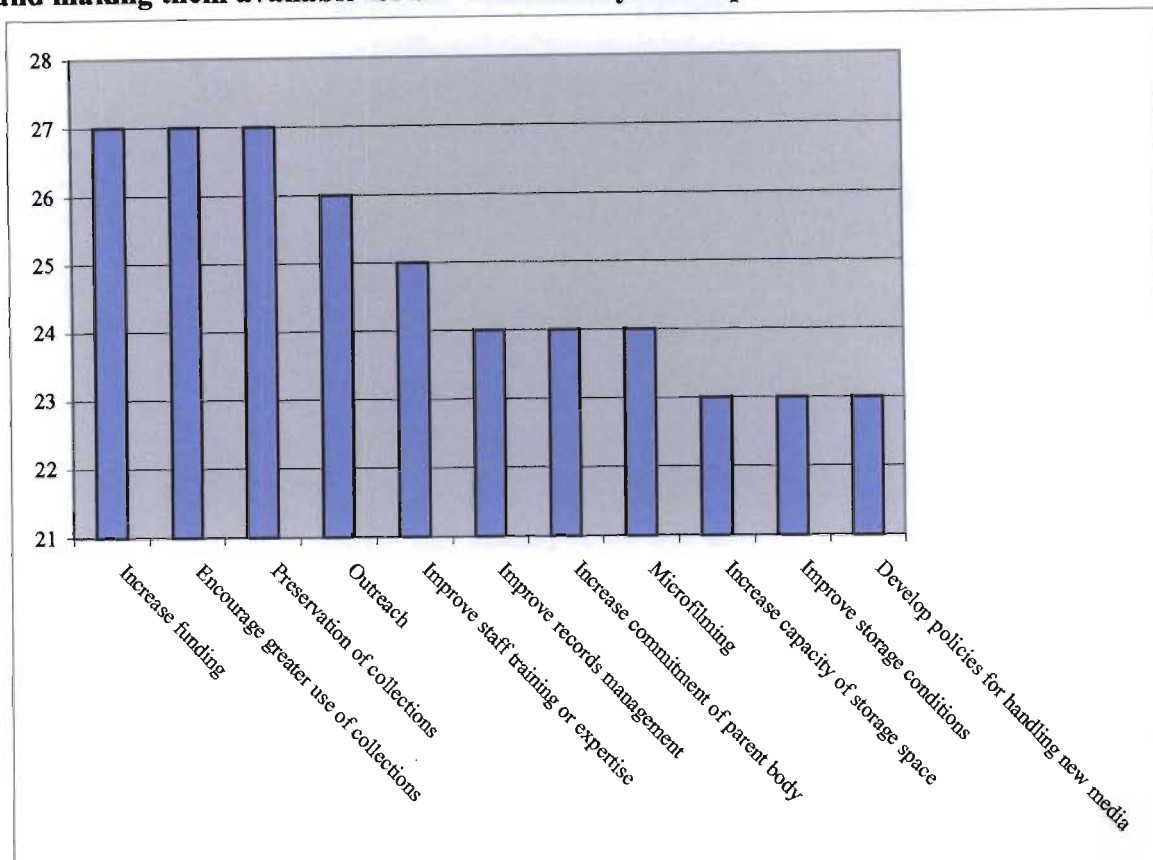
The surveyed archival institutions had a variety of priorities in managing records and making them accessible. The raw scores presented in Table 34 and the pictured portrayed in Figure 18 are revealing. Figure 18 only depicts the top 11 priorities for improving the management of archives and records and making them available for use identified by the respondents. It is evident that increased funding, greater use and preservation of the holdings were among some of their major priorities.

Table 34: Priorities for improving the management of archives and records and making them available for use identified by the respondents

Priority	Raw score					Total score	Rank
	0	1	2	3	4		
Increase funding				1	6	27	1
Increase capacity of storage space		1		2	4	23	5
Improve storage conditions (temperature & humidity controls, security)		1		2	4	23	5
Improve staff training or expertise		1			6	25	3
Encourage greater use of collections				1	6	27	1
Improve finding aids		1			5	21	7
Automate description systems	1		2	1	3	19	8
Microfilming			1	2	4	24	4
Develop policies for handling new media				5	2	23	5
Preservation of collections				1	6	27	1
Develop disaster plan		1	1	1	4	22	6
Process backlog of acquired collections			2	2	3	22	6
Improve records management in government agencies			1	2	4	24	4
Increase commitment of parent organization			1	2	4	24	4
Increase visibility of or public support for archives and records programmes				2	5	26	2

Table legend: 4=major priority; 3=moderate; 2=minor; 1=not a priority; 0=undecided

Figure 18: Top eleven priorities for improving the management of archives and records and making them available for use identified by the respondents



5.4.5 Information technology and access to records and archives in South Africa

Information technology has brought some radical organizational changes to accessing information. Electronic access tools are increasingly used to enable much broader access to information. The respondents were asked to indicate how they used computer-based technologies to provide access to their holdings. For the most part, some of them have been creating automated tools that describe the records in their custody, that is, bibliographic catalogues, indexes, and other finding aids.

Over time, automated bibliographic tools have evolved from being strictly local stand-alone systems to integrated networks that have been made available over the Internet at five (71.43%) surveyed archival institutions. Interviews and observations established that archival institutions were not using automated tools to deliver actual contents of the records. The surveyed institutions used the Internet for giving information about their archives as summarized in Table 35.

Table 35: Information offered by archival institutions over the Internet

Kind of information offered over the Internet	Total	Percentage
Access to descriptive databases	5	71.43
General information about the archives (for instance, "technical" information like addresses and opening hours)	5	71.43
Links to other archives	4	57.14
Information about access and use conditions (laws and regulations)	3	42.86
Information about fonds and records	3	42.86
General historical information	1	19.29

The questionnaire and interviews revealed that the Internet was mostly used to give access to descriptive databases and providing general information on the opening hours of the archives repositories and contact details of the archival institutions.

5.5 LEGAL SITUATION RELATED TO THE PRESERVATION OF RECORDS AND ARCHIVES IN SOUTH AFRICA

Three (33.33%) out of the nine surveyed archival institutions had their own archives legislation. The other six relied on the National Archives South Africa Act of 1996, as amended. It is noteworthy that those provincial archives without their own archival legislation were planning to formulate one and present it to their respective provincial legislatures for approval. Ms Marian George, Head of the Cape Town Archives Repository, succinctly summarized the position of most archival repositories without their own legislation as follows:

In accordance with the Constitution of the Republic of South Africa all provincial repositories should have their own archival legislation. In that regard, the Cape Town Archives Repository I am currently heading will fall under the Provincial Administration of the Western Cape and no longer under the National Department of Arts and Culture.

All claimed that their archival legislation spelt out issues relating to the preservation of, and access to their archives and records. However, one respondent conceded that although the preambles of their archival legislation underscored the preservation of records and archives, the actual preservation activities were only partially alluded to in the section dealing with

reprographic processes that the archivists have to carry out in order to save deteriorating documents.

All surveyed archival institutions thought they had a role in the effective implementation of the Promotion of Access to Information Act, 2000. Some respondents indicated that the piece of legislation on access to information was going to help them to give access to semi-current records in their archival repositories and records centres that are affected by the twenty years closure period. One respondent felt that the government bodies would improve their records management practices in order to promote access to current records held in their office if need be. In that regard, archival repositories would assist government departments in designing and implementing sound records management systems in order to comply with the provisions of the freedom of information legislation.

Respondents had not experienced difficulties in seeking to promote access in terms of the Act because most of the records housed in archival repositories were more than twenty years old and in terms of the National Archives South Africa Act of 1996 and their respective provincial archival legislation such records were open to public inspection. Some respondents felt that the full impact of the Promotion of Access to Information Act had not been felt, as the Act had not yet been fully implemented.³³

5.7 SUMMARY

This chapter dealt with the analysis and presentation of the findings from the data obtained from the field survey. The surveyed repositories collectively held 121 718 linear metres of records and archives. Although the holdings were predominantly paper-based, photographs, microforms, electronic records and audiovisual materials were also part and parcel of the type of record formats found in archival institutions in South Africa.

A lack of firm mission statements and archival policies suggests that the preservation of public records and archives was not a major priority for archival institutions in South Africa. Many

³³ Public and private bodies were supposed to prepare and submit their PAIA manuals to the South African Human Rights Commission (SAHRC) by 28 February 2003 (South African Human Rights Commission 2003). The data of the present study had been collected by then. The impact of the PAIA manuals on the implementation of the PAIA Act remains to be seen.

archival repositories performed preservation activities, although preservation did not seem to be a core activity of most repositories. Preservation remained less visible than other activities like describing archives and making them accessible. Some of the major findings were:

- Resources allocated for archival programmes varied from institution to institution.
- Most archival institutions did not have a specific vote for preservation activities and preservation expenditure had generally remained stagnant over the past five years.
- Preservation facilities such as conservation workshops were conspicuous by their absence.
- There was very little collaboration between archival institutions in South Africa with other heritage institutions in the country and abroad.
- The majority of the respondents rated preservation policies and strategies as being of limited success.
- Generally speaking, archival institutions had in-house standards for describing archives and more than half the surveyed number adhered to storage standards.
- Some archival holdings were stored in buildings that were not originally constructed to accommodate archives.
- Environmental control and monitoring in most surveyed institutions was inadequate.
- Chemical methods were used to control pests.
- Storage areas were generally kept clean.
- There were hardly any disaster plans for records and archives.
- The state of records and archives was reported to be average.
- Conservation treatment was very rare.
- Microfilming as a document preservation strategy was not widely used in archival institutions in South Africa.
- Very few institutions had electronic records in their custody.
- All surveyed institutions could not estimate the quantity of digital materials for which they had responsibility over.
- Expertise in digital preservation ranged from novice to intermediate.
- Some of the personnel involved in preservation activities were not trained in key preservation processes such as microfilming, deacidification and digital preservation.

- The level of expertise in dealing with preservation activities such as disaster planning and recovery, holdings maintenance, microfilming and environmental monitoring and control was very low.
- Access to records and archives was governed by archival and FOI legislation.
- More than half of the surveyed institutions carried out user needs regularly.
- Most of the records were described in the finding aids.
- Some records could not be accessed because they had either deteriorated beyond use or the equipment to access them was not available.
- Although, there were very few written public programming plans. archival institutions carried out awareness raising campaigns.
- The five major priorities for improving the management of records and archives and making them available for use were identified as increased funding, encouraging greater use of records and archives, preservation of holdings, outreach activities and improving staff expertise.
- The Internet was used to give bibliographic information about holdings.
- The impact of the Promotion of Access to Information Act has not been significantly felt, as the Act has not yet been fully implemented.

The next chapter interprets the data that was presented in this chapter. The main trends and patterns in the data are discussed with reference to the research questions outlined in section 1.2 of Chapter One.

CHAPTER SIX: INTERPRETATION OF THE RESULTS

I keep six honest serving-men

(They taught me all I knew):

Their names are What and Why and

When and How and Where and Who (Kipling 1903:87)

6.0 INTRODUCTION

The previous chapter provided data about the units of analysis being studied. As a typical descriptive study, the results can only describe the “who, what, when, where and how” of a situation, not what caused it. In that regard, one of Kipling’s (1903:87) “honest serving men”, namely “why”, was ignored in the interpretation of the results of the present study. This chapter shows us what the units of analysis shared in common, and what made them distinctive from one another. According to Neuman (2000:473) the discussion chapter should be separated from the results so that readers can examine the data and arrive at their own interpretations.

The findings are presented according to the themes of the objectives of the study and sub-problems posed as part of the research question in section 1.2 of Chapter One. The general purpose of the study was to provide information needed to enable practitioners in South Africa to both plan and implement sound records and archives care programmes and contribute to the development of archival preservation programmes that facilitate access. The specific objectives were to:

- assess the activities and strategies used in the preservation of records and archives in South Africa;
- examine the legal situation related to the preservation of records and archives;
- establish the impact of information technology and its implications for preserving records and archives and making them accessible over time;
- ascertain the means and processes employed to make information contained in archives and records accessible;
- establish the level of skills and experience in preservation management in South Africa;

- establish potential and actual impact of new laws regarding access to information on the preservation of records and archives;
- determine the steps that have been undertaken to safeguard records and archives; and
- contribute facts, analysis and recommendations on preservation issues.

The discussion of salient points is based on the survey questionnaire analysis, visits to selected archives repositories, unstructured interviews with members of selected stakeholder institutions and a review of the literature related to preserving archives and records and making them available for use.

6.1 PATTERNS OF DATA FOR EACH RESEARCH ISSUE

The survey questionnaire, site visits and interviews that were carried out confirmed that the archival institutions that were surveyed were deeply committed to protecting their holdings for current and future use. The evidence provided in Table 34 shows that increasing funding, encouraging greater use of collections, preservation of collections, increasing the visibility of, and public support for, archives and records programmes, and improving staff expertise were among the top five priorities for improving the management of archives and records and making them available for use by archival repositories in South Africa.

However, despite this evidence of diverse interest in preserving public records and archives, and making them accessible, the research identified a number of indicators that point to critical problems or challenges facing archival repositories in South Africa. The indicators that point to major challenges to preserving public records and archives in South Africa and making them accessible to users are discussed in the ensuing sections.

6.1.1 Strategies used in the preservation of records and archives in South Africa

Regarding the current preservation activities and strategies in South Africa, findings are discussed in relation to archival infrastructure, preservation policies and means, environmental control and pest management, disaster preparedness and security management, the state of the archival heritage, standards for preserving documentary materials and efforts that have been made to preserve audiovisual formats.

6.1.1.1 Archival infrastructure for the preservation of records and archives

Preservation activities were highly underdeveloped in many provincial repositories. It was evident that the National Archives and Records Service of South Africa (NARSA) had not followed up the mandate of decentralising archival services by developing a comprehensive framework for the provincialisation of archives (Dominy 1999/2000:87). As a result, the state of preservation of, and access to public records and archives was highly unsatisfactory. Some provinces did not have custody of their archives because they were still held in other parts of South Africa. It was evident that political provincial boundaries were drawn without regard to the fate of the provincial archival documentary heritage.

Two of the nine surveyed institutions had archives that were held in other provincial archives repositories. For instance, archives of the Northern Cape Province were still held in the Western Cape. Interviews with respondents revealed that it would take a while before the problem could be addressed because the archival institutions in the affected provinces did not have the required infrastructure to preserve records and make them accessible. They did not even have archival legislation to use as a framework to establish a provincial archives service. In some instances, staff for archival services had been appointed, but there were no repositories where records and archives could be kept.

As things stand, these provinces seemed to have a limited role when it comes to ensuring that public records and archives in their provinces were preserved for the present and future generations. As demonstrated in section 3.1 of Chapter Three, the lack of a broad provincialisation programme might impact negatively on the preservation of records and archives in South Africa.

6.1.1.2 Preservation policies and means

According to Forde (1997:165) preservation policies for cultural materials are indispensable tools for organisations that are committed to facilitating the survival of materials in their custody. In public institutions, such policies are partly enunciated in mission statements and business plans. It is evident from the results presented in Table 10 in the previous chapter that archival institutions were not very clear as to what their mission statements were. On the other hand, they stated that the documents that contained their mission statements were their

provincial and national archives legislation. However, the wording in the mission statements provided by the respondents did not correspond with what was contained in their respective archival legislation.

Such confusion among South African archival professionals could be partly explained in terms of the respondents' ignorance of the essence of mission statements. To begin with, it is misleading to consider archival legislation as a mission statement. Instead, legislation should be viewed as a strategic "blueprint" of an archival institution. In spite of being de jure policy (see 2.10 of Chapter Two), according to Mnjama (1996b:31) archival legislation defines broad functions of an archival institution and does not explicitly address policy issues. In that regard, mission statements provide greater specificity and should go beyond the legal requirements of law. Current national and provincial archival legislation in South Africa only underscores the need for a strategic approach to the preservation and care of records and archives without addressing the how and what dimensions of preservation planning. Thus, a mission statement gives an organisation a purpose and identifies the values for which it strives. According to Meshanko (1996) a mission statement should be a single sentence, clear and concise statement that states the name of the organisation and what type of an organisation it is, what it does, for whom and where.

Ideally, a mission statement should contain three elements; namely, purpose, business statement and values. According to Meshanko (1996) the purpose statement clearly indicates what the organisation seeks to accomplish: Why does the organisation exist? What is the ultimate result of its work? The business statement outlines the activities or programmes the organisation chooses in order to pursue its purpose. Values are beliefs that the organisation's members hold in common and endeavour to put into practice. The values guide the members of the organisation in performing their work.

In a nutshell, a mission statement answers the questions: Why does the organisation exist? What business is it in? What values will guide it? According to Covey (2002):

An organizational mission statement - one that truly reflects the deep-shared vision and values of everyone within that organization - creates a great unity and tremendous

commitment. It creates in people's hearts and minds a frame of reference, a set of criteria or guidelines, by which they will govern themselves.

Without a mission statement, it is extremely hard to effectively execute an organisation's core programmes. According to Swartzburg (1995:30) if a mission statement does not exist, planning for preservation becomes very difficult if not impossible. In the end preservation activities become characterized by a hit and miss approach. The words of Lewis Carroll through the Cheshire Cat in Alice in Wonderland eloquently summarized the importance of mission statements: "If you don't know where you are going, it doesn't matter which way you go" (Cheshire Cat 2001). It is evident that to be effective participants in the management and delivery of public information resources in general, and in South Africa in particular, archivists and records managers must articulate a clear sense of their mission and purpose so their activities are guided by a clear vision.

Most archival institutions that were surveyed supported some forms of preservation activities, although not all of these functions may be identified as part of a formal programme based on a clearly articulated policy. The fact that only one archival institution had a written and formalized preservation policy means that most archival institutions in South Africa had what Menou (1991:50) referred to as *de facto* policies.

The problem with *de facto* policies is that they tend to be conservative and uphold the status quo rather than provide "public intent of transforming practice according to ideal values" Ranson (1995:440). On the other hand, codified and stipulated or prescriptive policies facilitate a creative allocation of funds and staff, and specify other aspects of implementation and monitoring. Mnjama (1996b:31) reiterated this point when discussing the importance of records management policies in relation to allocating resources. Written policies also serve as binding contracts between the archival institutions and the stakeholders. They help set standards. Written policies can also be used as tools for staff training and evaluation.

Lack of preservation policies was also highlighted in the UK as a factor that hindered effective preservation management (Feather & Eden 1997). A study carried out in the UK in 1996 discovered that only 32 (16%) of the 167 respondents had written preservation policies (Feather & Eden 1997:27). Although the existence of preservation policies does not guarantee

their implementation, the Pan-African Conference on the Preservation and Conservation of Library and Archival Materials strongly recommended that each country establish a committee to develop a national preservation policy for implementation by government (Recommendations 1995:170). It is evident that without funding and personnel with expertise, the implementation of preservation policies would be extremely difficult.

In the present study, two (28.57%) respondents rated preservation policies and strategies as moderately successful, four (57.14%) considered them to be of limited success and one (14.29%) institution which had archival holdings considered it to be unsuccessful. Funding, lack of key personnel and commitment were cited as some of the key factors that inhibited the success of their preservation policies. As a result preservation of records and archives has not received the attention it deserves. An informant at one of the surveyed institutions eloquently remarked:

Preservation has not received the attention it deserves over the years. The National Archives is going through a restructuring process at the moment and the result of this was the appointment of a preservation manager. Work is underway to create and structure for the preservation section and to determine which functions will be preformed and at what level.

Even if most archival institutions did not have a written preservation policy, four (44.44%) of the nine surveyed archival institutions had some de facto policies to improve preservation conditions. Two (22.22%) had a policy to develop conservation facilities and to microfilm their records and of the four, three (33.33%) had a policy to train and recruit qualified personnel. Although most institutions did not have a written preservation policy, five (55.56%) reported that they had a preservation strategy. De facto policies are not likely to effectively help the preservation cause. How does one measure performance without an established yardstick? How could funds be allocated to a programme that is not clearly defined? The researcher of the current study is optimistic that preservation policies in South Africa could be developed very soon. In fact, some informants indicated that they were either actively formulating them or were planning to start the process.

As mentioned in the preceding paragraphs, funding is key to formulating and implementing preservation programmes. Dedicated funding lines for preservation activities were very difficult to establish in many archival institutions and it was not clear as to how and to what degree preservation was funded in most of the institutions that were surveyed. Only three (33.33%) of the surveyed institutions had a specific vote for preservation activities. According to Conway (1990:217):

The existence of a specific item for conservation treatments and supplies in the annual budget of an archival institution is an important indicator that archivists are institutionalising preservation activities.

The fact that there were no specific budget lines for preservation activities in the institutions that were surveyed showed that preservation activities were given a low priority. Khayundi (1995:32) studied eastern and southern Africa, excluding South Africa and Namibia, and came to the same conclusion. It is clear from the results of the present study that the situation in South Africa was not different from the rest of eastern and southern Africa. It is no wonder that only two of the surveyed institutions described their preservation programmes as moderately successful.

The problem of preserving archives and records was compounded by the fact there were no conservation facilities in most archival institutions in South Africa. Only one archival repository had a conservation workshop operating at its institution. The situation in South Africa was not different from the state of affairs in the rest of Africa. Most archival institutions surveyed by Mbaye (1995) did not have technical workshops to carry out conservation and restoration activities. Lack of restoration equipment and facilities was also cited as a problem in Zambia (ESARBICA 2000). It is evident that no amount of training or policy making in the field of preservation can facilitate conservation treatment in the absence of basic preservation facilities like workshops.

Given their limited preservation means, it is surprising that collaboration among archival institutions in South Africa and other heritage institutions such as art galleries, libraries and museums was very limited. Co-operative approaches to preserving the priceless and irreplaceable cultural heritage were strongly encouraged by UNESCO (2000). In that regard, the executive board of ESARBICA (2001) called for more collaboration between countries in

the ESARBICA region in light of the fact that problems related to preservation and conservation of archival materials were quite common and “often severe in many countries in the region”. According to ESARBICA (2001), “one way of doing so is to develop a Conservation Centre for the purposes of training conservators in the region, and to carry out research in the same field”.

The importance of collaboration with other colleagues from some cultural institutions such as libraries and museums was also underscored in the literature. Conway (1990:222) implicitly made a strong case for collaboration when he pointed out that archivists should learn from librarians in the UK and US who had already made “unprecedented progress” in setting priorities, and developing and implementing nationwide preservation strategies. Walters (1998:179) reiterated the point emphatically:

Once archivists and library preservation professionals have learned more about their shared concerns and program elements, they will be ready to work closely. The priority item on their agenda should be identifying opportunities to improve library processes and administrators’ perceptions so that collaborative preservation management is supported and encouraged.

6.1.1.3 Environmental control and pest management

Records and archives need protection from the environment and biological factors. Storing records and archives in appropriate buildings, monitoring and controlling temperature, humidity and light, controlling pests and handling are key to safeguarding archives. Findings of the study in relation to these factors are discussed in the following sections.

6.1.1.3.1 Archival buildings: the first line of defence

According to Mackenzie (1995:129) and Mazikana (1997:145) the protection of records and archives begin with the buildings in which they are housed. In that regard, buildings have been characterised as “the first line of defence against a severe climate and various disasters” (The National Archives of the Netherlands *et al.* 2001:77). Custom-designed archival buildings offer more advantages than adapted ones.

The results presented in the previous chapter showed that four (57.14%) institutions had custom-designed accommodation while three had adapted buildings. An informant from one of the three archival institutions stated that the adapted archival repository was not suitable for accommodating archives and remarked that it was a “shame that the national heritage was presently stored under appalling and deplorable conditions”.

Buildings that were not initially designed for housing archives only lend themselves to the necessary functional adaptation with difficulty and imperfection (Duchein 1977:20; Mbaye 1995:43). Recycling and adapting old and unsuitable buildings is very expensive (Thomas 1987; 1988). Although it is advisable to have custom-designed buildings, research done by The National Archives of the Netherlands and others (2001:89) revealed that most archival institutions in Africa adapted premises to house their holdings, therefore, the problem of inappropriate buildings was not peculiar to South Africa. A number of archival institutions in eastern and southern Africa had also adapted premises to house their holdings (Kemoni 1996:47).

Unlike in the ESARBICA region, where Moyo (2000:27) found that most archival buildings were not subject to regular technical maintenance, 57.14% of the archival institutions in South Africa maintained their buildings with varying frequency. Concrete and bricks were used to construct most archival buildings in South Africa. Building materials are key to reducing the impact of climatic factors on the building and the materials housed in it (Daniel *et al.* 2000:45). The impact of the environment on buildings and the materials stored in them can be exacerbated by the location of the building. Some sites are not ideal for the preservation of records. More than half (57.14%) of archival buildings in South Africa are located in areas experts such as Duchein (1977:22) and The National Archives of the Netherlands and others (2001:87) considered to be perilous to the preservation of records and archives.

Table 15 in the previous chapter showed that some archival institutions were located in areas with considerable air pollution, and military and water hazards. Under the circumstances, there is very little that the archivists can do to change the situation. The circumstances at each archival institution vary and it would not be prudent to relocate the buildings given resource

constraints. These are risks that should be taken into consideration when designing disaster management plans that are discussed in section 6.1.1.4 below.

6.1.1.3.2 Temperature and relative humidity in the storage environment

Also of concern in all archival repositories is the quality of the storage environment in which records are stored. According to Peters (1998:42) environmental control is key to preventive preservation strategies in the management of collections. The storage environment is greatly affected by temperature and relative humidity (RH). Lower temperatures and a lower relative humidity greatly extend the life expectancy of documentary materials (Adcock. n. d.; Patkus 1998:73). Temperature and RH also play a major role in the multiplication of some biological agents.

According to Ogden (1996b) temperature and RH contribute significantly to the deterioration of materials. Extreme temperatures and humidities pose the major preservation challenges in most developing countries (Khayundi 1995:32; Musembi 1995:11; Porck & Teygeler 2000; Rhys-Lewis 1999:160; The National Archives of the Netherlands *et al.* 2001:49). The major preservation problems such as brittle records and archives, degrading nitrate and acetate film base, and audio and tape deterioration are a result of chemical reactions that are heavily influenced by storage temperature and RH (Reilly, Nishimura & Zinn 1995:2).

Five out of the seven archival institutions in South Africa that had archival holdings had a heating, ventilation and air conditioning (HVAC) system. The HVAC system can aid in controlling temperature and RH. According to Ritzenthaler (1993:51) air conditioning systems, such as HVAC are the most cost-effective means of caring for holdings. Bansa (1987a:11) and Duchein (1977:134) pointed out that the combination of the design of the building and air-conditioning systems are fundamental to achieving temperature and RH control in tropical and sub-tropical regions. Archival institutions in South Africa should be congratulated for managing to control temperature and RH in most of the repositories. The situation is in stark contrast with the revelation made by Mazikana (1997). His survey of archival institutions in Africa showed that air conditioning systems had broken down in most cases.

In the event of a power failure, alternative sources of power are required for HVAC systems to operate efficiently. It is evident that only two repositories had alternative sources of electric power such as a generator. Perhaps, the scenario where there was no electric power back up systems could have persuaded Peters (1996:8) to argue that the means of achieving the recommended values of environmental control are inadequate in many institutions in South Africa (Peters 1996:8).

Archivists in South Africa should also be concerned about either upgrading or replacing their HVAC systems. They should bear in mind that, according to Hadgraft (1994:47) and Briggs (1994:49), all air-conditioning systems have an in-built obsolescence with a life of about ten to twelve years. It is evident that the HVAC system in three archival institutions was more than 10 years old while it was said to be between four and ten years old at the other two. Regular maintenance of the HVAC facility would greatly help archival institutions to detect any early warning signs of technological obsolescence. It is very disappointing that one archival institution reported that it never maintained its facility.

In addition to having tools for controlling the climate in archival repositories, institutions should have a systematic monitoring programme in order to effectively manage the environment where records and archives are kept. Monitoring is the most dependable tool for decision-making and it holds the most promise for providing conditions favourable to the long-term survival of records and archives. Four (57.14%) out of seven archives repositories that had records in their custody claimed that they monitored temperature levels in their repositories constantly.

However, the claim was invalidated by the answers to Question 63 at Appendix Five. The answers to that question showed that only two of the surveyed archival institutions used environmental monitoring devices in their repositories. The two (28.57%) archival institutions also monitored RH levels in their repositories constantly. One institution used a hygrothermograph for measuring temperature and RH and another one used a hygrometer to measure RH. The fact that the hygrometer only measures RH means that the particular institution only partially monitored the environment. As demonstrated in Table Two in Chapter Two the hygrometer is not strongly recommended as an RH measuring instrument

because it can be very inaccurate and most cannot be recalibrated. In the USA, Conway (1990:218) found that 234 (73%) surveyed institutions did not have a hygromograph. According to Ritzenthaler (1993:57-58) hygromographs are precise instrument for measuring and monitoring RH and temperature and should be part of any documentary preservation kit.

Monitoring the environment where documentary materials are kept appears to be a worldwide problem. A study by the Council of State Historical Records Coordinators (COSHRC) in the US concluded that nearly half of the repositories reported that they had no humidity controls in their storage areas (COSHRC 1998). In another study in the US, Conway (1990:218) found that 56% of the respondents claimed to have controlled steady temperatures in areas where records and archives were stored. On the other hand, only 44% claimed to be able to control relative humidity in storage areas. In the case of the Massachusetts libraries and records repositories, Trinkaus-Randall (1990) revealed that 70% of the institutions could not maintain a constant climate throughout the whole year and most respondents knew very little about the effects of the environment on their collections.

Khayundi (1995:32-33) found that few archival institutions in eastern and southern Africa excluding South Africa and Namibia had equipment to control and monitor RH and temperature, although some environmental control systems had broken down. Another study conducted by Moyo (2000) in Africa found that some archival institutions in Malawi, Swaziland, Zanzibar and Zimbabwe did not systematically check and monitor temperature, RH and the quality of air in areas where records and archives are stored. Over and above controlling temperature and RH, archivists and records managers should also be concerned with light sources and their levels in the repositories. The effect of light in the repositories is discussed in the next section.

6.1.1.3.3 Light in the storage environment

Light in all its forms, especially in the presence of atmospheric pollutants, leads to a weakening and embrittlement of organic materials that constitute paper, photographs, magnetic tapes, film and all other forms of records found in archives (Porck & Teygeler

2000). Adcock (n. d.) argued that light damage is irreversible. Therefore, light levels must be kept as low as practically possible in storage, reading, and display areas. According to Banks (2000:124), Ogden (1996b) and Patkus (1999b) the standard limit for ultraviolet (UV) waves for preservation is 75 microwatts per lumen.

Archival institutions in South Africa did not have reliable ways of ensuring that records were stored in areas with the required amount of UV waves because they did not take light level readings at all. Only five out of seven repositories controlled natural light from the windows in their storage areas. Exposure to natural light is undesirable because of its intensity and high UV content. UV radiation is the most energetic and destructive form of light (Patkus 1999b). It accelerates photochemical deterioration and is extremely damaging.

6.1.1.3.4 Pest management in the archival environment

Biological agents such as rodents, termites, silverfish, cockroaches, booklice and beetles discussed in section 2.8.4 of Chapter Two are some of the threats to records and archives. Most archival repositories recognised the fact that pests either came into the holding on their own or as part of incoming records. Consequently, they checked all incoming archival materials and sprayed or fumigated their archival repositories from time to time. Although archival institutions in South Africa checked new accessions before they entered their repositories, they rarely disinfected them. However, the situation in South Africa was not as gloomy as in the ESARBICA region, where Moyo (2000:27) found that 83% of the national archival institutions neither checked nor disinfected their accessions before they entered the archives.

Spraying (22.22%) and fumigation (55.56%) were the two major methods that respondents used to exterminate pests. The fact that four respondents saw evidence of pests in spite of treatments partly confirmed the scepticism of some experts such as Chicora Foundation (1994) and Child (1999b) who suggested that by using chemicals we were doing little other than creating super-pests, with increasing resistance to pesticides. Chemicals also have harmful effects on human beings.

Interviews and survey questionnaires established that although many archival institutions had a contract for periodic spraying, they did not know the names of the companies that carried out the treatment. They were also ignorant of chemicals used in exterminating pests. It is disturbing that the survey also revealed that many respondents did not receive a copy of the label and a material safety data sheet for each pesticide used in their institutions, especially, in view of the fact that some chemicals have harmful effects on human beings.

If archivists and records managers are ignorant of the processes involved in treating their holdings, then effective management of pests in archival holdings will remain an unfulfilled dream in South Africa. It is noteworthy that a study conducted by Beckwith, Swanson and Iliams on chemicals used to control pests in libraries and archives found out that 28 commonly recommended fungicides were either ineffective in killing mould or damaging to paper (cited in Cunha 1988).

The findings show that some archival institutions use organophosphates such as Dichlorvos®, an active ingredient in pesticides such as Nuvan, Dipterex®, Dursban®, Demerin® and Malathion® to control infestations. Nuvan®, which was reportedly used in one of the surveyed archives repository, is highly toxic (Cornell University 2002). In fact, organophosphate insecticides were first developed in Germany during World War II as a by-product of nerve gas development (United States Environmental Protection Agency 2003). However, it is not known how much Dichlorvos is necessary to cause harmful effects in people (Agency for Toxic Substances and Disease Registry 2001). Due to the high neurotoxicity of organophosphates, potential effects on the health of records managers and archivists should be of major concern. According to the Chief of the Neuromuscular Section in the Department of Neurology at the New York Medical College, the manufacture of chlorpyrifos (Dursban) was phased out in the US in June 2000 because of the risks it posed to human beings (Dyro 2001).

Equally, Rentokil, which is used in some archives repositories, seems to pose a health hazard to human beings. Many Rentokil pest management products contain sodium fluoroacetate (Products from Rentokil 2003). Sodium fluoroacetate is an extremely toxic substance (United States Environmental Protection Agency 1995). Inhalation of dust or swallowing may be fatal.

The compound may also be absorbed through cuts or abrasions in the skin and lead to poisoning. According to Robinson and others (2002:93) the highly toxic sodium monofluoroacetate (SMFA) was banned as a rodenticide in the US in 1972. The extremely toxic nature of sodium fluoroacetate renders its household use highly inadvisable (Robinson *et al.* 2002:94). The sale and use of the compound is strictly controlled in many countries (United States Environmental Protection Agency 1995).

The scenario presented in the foregoing paragraphs shows that most of the chemicals used to control pests in archival institutions in South Africa were a potential human hazard. Use of pesticides in archives repositories has the potential result of chemical residues appearing on documentary materials, thus spoiling them as well as posing a threat to users. The provision of a copy of the label and a material safety data sheet for the pesticides used to control pests becomes critical to guaranteeing the safety and welfare of the people who use archival repositories. The archivists need to know whether or not the labelling of the pesticide product comply with the requirements of laws governing toxic substances. Some labels provide information to determine if one were being exposed, exposure limits, health hazard information and first-aid treatment for any symptoms of poisoning.

6.1.1.3.5 Handling and care of archival holdings

Proper storage and handling of records and archival materials can be relatively inexpensive, with several handling practices and storage measures costing little or nothing. In fact, storage conditions offer many opportunities to prolong the life span of documents because they contribute to their physical well being (Aziagba 1991:75; Banks 2000:125; Maidin 1985; Raphael 1993; The National Archives of the Netherlands *et al.* 2001:61). Furniture used in the storage of records and archival materials could contribute to the deterioration of the collections they house. Most archival institutions in South Africa used adjustable metal shelving. As Mackenzie (1995:132) pointed out, the major advantages of metal shelves are that they are adjustable to fit various sizes of archival objects, durable and fire resistant.

The choice of suitable shelving is fundamental to the preservation of archival materials. As discussed in section 2.8.5.2 of Chapter Two, shelving should be tested to establish its

suitability. The same applies to the boxes in which materials are stored. High levels of acidity in storage boxes could be detrimental to the life expectancy of archival materials. Yet archival institutions in South Africa had not incorporated testing of the equipment they used to store records into their archival practices. Records storage places in archival repositories in South Africa were reported to be generally clean. Eating and smoking are not allowed in the repositories. According to Rhys-Lewis (1999:162) cleanliness offers many benefits. Clean surroundings discourage fungi, insects and pests. Examining materials is key to identifying any damages on records and archives.

Materials could be examined during cleaning in order to provide an early warning of biological or chemical damage. They can also be examined during stocktaking. It is of major concern that the present study established that files are hardly ever examined and only three (42.86%) out of seven archival institutions carried out annual stocktaking of their archival holdings.

General handling raises serious preservation issues. Much of the damage that records and archives sustain is due to bad handling. Users and staff need to be trained and given guidelines on the handling of archival materials. Archival institutions in South Africa seemed to be doing relatively well in that area as users and staff were trained in the handling of records in four (57.14%) repositories. The situation in South Africa was clearly very different from what was happening in Zimbabwe where neither staff nor users were trained in the proper handling of records (Mavodza 2003). According to the National Preservation Office (2000b) training sessions in good handling practice and good copying practice are key to preserving archival materials.

Photocopying that was carried out in many archival institutions in South Africa also raises serious preservation issues. Used incorrectly, photocopying could cause severe damage to the structure of a document, but careful handling could prevent potential problems. A 1992 survey by the Society of Archivists' Preservation and Conservation Group concluded that photocopying placed serious physical strain on already fragile material (Weber 1993). Weber's (1993) conclusions were based on the 159 responses that were received out of a total of 425 questionnaires that were distributed. Photocopying was further characterized by the

study as constituting a major preservation problem. Five years later Feather and Eden (1997:18) made the same conclusions.

Users did most of the photocopying in archival institutions in South Africa. The National Preservation Office (2000b) recommended that photocopying should be carried out by the institution's own fully trained staff, with each item being examined for its suitability. Although, photocopying was not done when it was likely to cause damage to the records and archives themselves, interviews established that the criteria for restricting certain materials was not thoroughly understood by many staff members.

The National Preservation Office (2000b) also suggested that if it was not possible to allocate staff to carry out copying, the following precautions could help to minimize damage to records and archives by the public:

- positioning the machines where they are within clear sight of staff; and
- prominently posting clear and concise guidelines on careful handling close to the machines.

The observations that were made at the repositories that were visited established that while the public did most of the photocopying there were no guidelines on careful handling. However, machines were placed within clear sight of staff in most surveyed institutions. At one of the surveyed archival repositories, users were utilizing the photocopying machine in a room separate from the reading room without any supervision whatsoever.

The problem of archival storage space is looming in the South African public archival landscape. The figures provided in Table Five in Chapter Three show that there was an acute shortage of space being experienced by the National Archives Repository, NFVSA, Pretoria Records Centre and other archival institutions in South Africa (Directorate State Archives and Heraldic Services 1999-2000:27).

The current study found that although, five archival institutions had plans to expand their storage space, only three out of all the surveyed archival repositories had adequate space for shelving and storage of records and archives. The acute shortage of space in most archival repositories is likely to impact negatively on proper records management programmes

(Department of Arts, Culture, Science and Technology 2001:69). Government departments might be tempted to dump their records into basements and dungeons if archival institutions were unable to take them into custody. Experience has shown that records that are removed from current records management systems and dumped into other rooms are generally not accessible due to the unsystematic manner in which they are transferred. It is apparent that very soon most repositories will be full and they will be forced to stop accepting new accessions. There is need for NARSA to strategically plan for that eventuality.

6.1.1.4 Disaster preparedness and security management in archival repositories

Disaster planning is generally regarded as an essential part of any preservation programme (Conway 1990:219). Feather (1991:69) also drove the same point home when he pointed out that a disaster plan is central to the preservation strategy and was a key element in preservation policy-making. Despite the fact that a disaster preparedness plan allows an organisation to plan and make decisions about emergency response and recovery archival repositories in South Africa had not made it part of their preservation strategy. Only one (14.29%) archival repository had a written disaster preparedness plan that dealt with records. The disaster plans reported by three other respondents did not specifically address disaster preparedness in an archival and records management environment. They were organisation wide disaster plans that did not specifically with risks associated with the preservation of records.

As in South Africa, disaster preparedness as a document preservation strategy was also a neglected area in England, Wales and Northern Ireland. Surveys of disaster planning in libraries and archives in these countries showed that only 6.6% of the institutions surveyed had disaster control plans in use, and that a further 3.7% had plans under preparation (Feather 1991:69; Jenkin 1987:2). The situation was slightly more positive in the US where Conway (1990:219) found out that 56% of the respondents had disaster plans or were in the planning stages.

However, when it comes to plans for how to respond if holdings were hit by human or natural disasters, the South Africa situation was similar to the one that once prevailed in the US. The present study revealed that out of the four respondents who had disaster plans, only one (25%)

institution had a plan covering natural disasters such as floods. In a study in the US Conway (1990:219) found out that only 19% of the repositories participating in the survey had a plan for how they would respond if their holdings were hit by a disaster like a flood or fire. In another survey in the US, the COSHRC (1998) concluded that despite widespread acceptance in the professional literature of the usefulness of disaster plans in managing archives and records, their actual use in repositories was far more limited.

Disaster planning ensures that institutions are prepared to respond quickly to emergencies. Disaster mitigation, or the ability to identify risks and prevent some emergencies from happening, should always play a key role in an institution's emergency preparedness and planning efforts. In addition to large-scale emergencies, institutions should also be aware of the danger to their holdings from roof leaks, pest infestation, mould blooms, theft and fire.

Perhaps the most important point raised by the report of the COSHRC (1998) with regard to disaster preparedness was that it provided evidence that educational efforts at the state level regarding the development of disaster plans increased the number of institutions that made use of them. NARSA should use the power vested in it by paragraph (g) of section 3 of the National Archives of South Africa Act of 1996, as amended to "assist, support, set standards for and provide professional guidance to provincial archives" in the field of disaster management. That might increase the number of institutions with disaster plans at a provincial level in South Africa as was the case in the study reported by COSHRC (1998).

Records and archives in South Africa were relatively well safeguarded against flooding of the floors because most archival institutions stored the records more than ten centimetres above the ground. However, the likelihood of a disaster caused by flooding, however, was relatively high in four repositories where water-bearing pipes were between two and four metres from the storage areas. One repository reported that it was located on a spring of water, yet it did not have a disaster preparedness and recovery plan that covered flooding. The problem of potential flooding caused by water-bearing pipes is ever present in many organisations. A study carried out by Samushonga (2000:11) in Zimbabwe established that more than half of the records offices were very close to toilets and kitchens.

Lack of electrical backup services could compromise the security of public records and archives in South Africa. Only two repositories had alternative sources of electric power such as a generator. Most security systems such as fire alarms and CCTV depend on a reliable source of power in order to work efficiently. Besides this major setback, archival institutions appeared to be doing relatively well when it came to safeguarding their holdings. Records were stored in areas that were secured against theft with locks, or other devices. The security of records in archives repositories in South Africa, however, can be guaranteed within reasonable limits because the six archival repositories that had custody of public records and archives employed security personnel round the clock. In some instances security monitoring devices were used.

Many repositories were equipped with fire extinguishers and fire detection systems that were connected to a central monitoring facility. The availability of portable fire extinguishers to complement automatic fire suppression systems are strongly supported by experts such as Adcock (n. d.). The wet-pipe sprinkler systems used in most repositories in South Africa are believed to be a reliable and safe extinguishing method and are relatively easy to maintain (Thomas 1992).

However, archivists and records managers should be familiar with the brand names of fire suppression and detection systems used in their repositories, so that they would be able to roughly estimate the degree to which their holdings would be safe depending on the efficiency and reputation of the system. For instance, it was encouraging that one of the respondents used the Ziton fire detection system that was manufactured by a South African company that was a leading player in the international fire detection market (Ziton 2003). One of the most worrying findings concerning South African archival repositories was that most of the surveyed repositories did not work closely with their local fire departments. It is evident that in most cases fire departments play a crucial role in suppressing and controlling all sorts of fires.

6.1.1.5 Strategies and activities for preserving audiovisual formats in South Africa

As outlined in section 2.6.3 of Chapter Two, carriers of audiovisual information comprise films in colour and black and white, on nitrocellulose and acetate bases, in 8mm, 16mm,

35mm, and 70mm formats; videotapes from half-inch to two inches, in VHS, Umatic, Betamax and many other configurations. It is evident that there can be no audiovisual inheritance, unless all the technical problems associated with technological obsolescence and instability of the media are recognised and dealt with.

Unfortunately, very little can be said about the current situation in relation to the preservation of audiovisual materials in South Africa on the basis of the data that was collected by the present study. In that light, the present study recommended in section 7.7 of Chapter Seven that another study on the preservation of audiovisual formats in South Africa be carried out. Derges (1992:95) has highlighted the lack of information on audiovisual formats in the ESARBICA region. One wonders whether or not the situation has changed.

It was the intention of the present research to assess the extent to which audiovisual materials were preserved and made accessible. A negligible amount of data was collected in that regard because the National Film, Video and Sound Archives, the main custodian of audiovisual materials in South Africa, did not cooperate with the researcher.³⁴ The questionnaire at Appendix Seven was sent both through the conventional postal system and e-mail. Several reminders and telephone calls only yielded promises which proved to be empty.

The audiovisual holdings of the surveyed institutions were very small. They constituted 0.57% of all their archival holdings (see Table Nine). The situation is not peculiar to South African archival institutions. Audiovisual collections in the archives were reported to be very low in many countries in southern and eastern Africa in the years 2000 and 2001 (ESARBICA 2000; 2001). The level of expertise in dealing with audiovisual materials was relatively low (see Table 26 and Figure 13). Most of the respondents (88.89%) needed additional training in the preservation of audiovisual materials (see Figure 14). A study carried out by Derges (1992:99) identified lack of expertise in the preservation of audiovisual materials as a major problem in the ESARBICA region. It is evident from the present study that expertise in audiovisual

³⁴ Among other things the Legal Deposit Act, No. 54 of 1997 provides for the preservation of the national documentary heritage through legal deposit of published documents; to ensure the preservation and cataloguing of, and access to, published documents emanating from, or adapted for, South Africa and to provide for access to government information. NFVSA is a place of legal deposit for audiovisual materials.

preservation was limited in South Africa. It was also very clear from the literature that very little was being done to copy deteriorating audiovisual formats to durable media because the national archives could not afford the expensive equipment (Directorate of State Archives and Heraldic Services 1999-2000:14).

6.1.1.6 State of the records in archival repositories

Figure 11 in the previous chapter presented the various factors that contributed to the deterioration of records and archives in South Africa. At the top of the list was poor handling and acidity of paper at equilibrium with 57.14% followed by mould and insects both pegged at 42.86%. In fact, six (85.71%) out of the seven institutions that participated in the survey had observed deterioration of documents resulting from the use by the public. The summated rating scale computed in Table 21 shows that the condition of records and archives was generally poor. The picture that emerges from the computed scores in Table 21 is that something must be done about moulds, acidic and brittle paper and handling of records and archives.

The condition of records ranged from unsatisfactory to average at five archival institutions. Estate papers of the Master of the High Court were reportedly in a very poor condition by the majority of the respondents. A large-scale deterioration of paper-based records was also reported in the literature in South Africa (DACST 1998:20; Directorate State Archives and Heraldic Services 1995-1997:10). Preservation activities such as deacidification and microfilm could assist South African archivists to save their records and archives from deterioration as a result of handling and acidity.

As Ritzenthaler (1993:144), Pilette (2003), Swartzburg (1995:265) and Wachter (1989) argued, deacidification processes should be used to extend the life of paper-based materials by neutralizing acids in paper and impregnating it with an alkaline reserve that prevents the build-up of acid-induced degradation. However, terms like “neutralisation” and “alkalisation” are gaining currency in the conservation field because they are regarded as being more precise than the term “deacidification” (Ritzenthaler 1993:144).

The chances that most of the documents in archival institutions in South Africa were created on acidic paper are high considering the fact that the archival repositories held records from the seventeenth and nineteenth centuries. In fact, according to Westra (1987a:29), records and archives that were produced in South Africa before 1987 were created on acidic paper. On the other hand, McCrady (1993) pointed out that about 25% of documents produced between 1500 and 1699 were created on paper with an average pH of 6.7. The pH dropped to 4.9 between 1700 and 1899. Ninety five percent of the documents produced between 1899 and 1949 were created on paper with a pH of 4.8 (McCrady 1993). There is a great correlation between pH and paper stability although pH alone is not the only determinant in destabilizing paper. Paper with 4.0 pH is ten times more acidic than paper with 5.0 pH. According to tests done at W.J. Barrow Research Laboratory (1967), paper with a pH of 7.0 lasts twenty times longer than paper with a pH of 4.8. Pilette (2003) pointed out that, although many areas of the world had made strides in producing alkaline paper, there were still many other places that were still producing acidic paper. Conservation and restoration strategies such as deacidification become critical to the preservation of documents in circumstances where acidic paper is used.

Table 25 showed that only five people dealing with conservation activities had training in deacidification. However, it is important to note that deacidification does not strengthen and support paper as discussed in section 2.5.3 of Chapter Two. Lamination, encapsulation and providing microenvironments are some of the ways generally used to stabilize, and at times to support and strengthen, paper. Encapsulation was the only paper strengthening and support process reported by one archival institution in South Africa. It is evident that archival boxes used by some of the respondents created microenvironments for public archives and records. Efforts are at least being made to safeguard materials, although, the archival boxes were not tested for acidity.

It is noteworthy that Passaglia (1987) suggested that cardboard boxes used to safeguard a large quantity of archival material, were very vital. Documents stored in boxes are protected against atmospheric pollution, solar radiation, fungus and fire. In some countries, inert plastic boxes are beginning to replace cardboard (Crespo & Viñas 1990). In the event of a fire, records and

archives stored in full boxes in open shelves fare better than those loosely stored. The tight files allow little oxygen in and often only exterior edges are frequently damaged.

In addition to the restoration processes described in the preceding paragraph, reformatting could be done to deflect use from original materials, provide a secure backup for originals in case of loss and to replace originals that are already threatened by instability or technological obsolescence. As discussed in section 2.7 of Chapter Two, reformatting encompasses microfilming, digitisation and photocopying. However, microfilming has proven to be an effective technology for preserving archival materials vulnerable to damage and loss through handling and poor environmental conditions. It could greatly help information professionals to balance the potential conflict between preservation and user access. Microforms were widely used in most archival institutions in Africa to guarantee access to deteriorating documents as well as archives in the custody of former colonial powers (Coates 2000; Ngulube 2002a:126).

However, the use of microfilm as a document preservation strategy was very limited in South Africa. Institutions did not have the capacity to carry out microfilming activities. Microfilming projects were generally outsourced. Microfilming equipment and skills in microfilming were scarce. Only one institution had in-house microfilming facilities with one camera. Lack of microfilming facilities, and microfilming of deteriorating materials on a project basis could delay the microfilming of small quantities of deteriorating documents.

Table 26 shows that that expertise in microfilming was ranked very low. However, it is encouraging to note that all the surveyed institutions required additional training in microfilming. It is evident from Figure 18 that microfilming featured among the eleven top priorities identified by South African archival institutions for improving the management of archives and records and making them available for use.

6.1.1.7 Standards for preserving and making records and archives available for use

Standards have been characterised as one of the best indicators of the state of development of a discipline (Couture 1996:101). Standards and their application are essential in maintaining a professional approach to the preservation of records and archives. Accordingly, standards provide a solid basis for archive services and act as yardsticks by which the services can be

monitored and measured. Indeed, standards are inextricably related to quality. Standards are playing an increasingly important role in archival practice because of the various formats in which the archives are recorded and the need to exchange archival sources. According to Rhys-Lewis (1999:167) there is need for the archival profession to clarify fundamental questions relating to standards and best practice to ensure the proper preservation of records and archives.

The findings of the present study showed that archival institutions adhered to some national standards in the preservation of South Africa's archival heritage and making it accessible. However, only three (42.86%) surveyed institutions reported that members of staff were familiar with the standards used for storing, describing and preserving records and archives. At a conceptual level, respondents did not seem to fully understand what standards were. Apart from the standard for describing archives cited by all the respondents, one cannot consider national and provincial archival legislation, or even the Promotion of Access to Information Act for that matter, as standards for aiding preservation of, and access to records and archives in South Africa.

Perhaps, if the respondents had cited handbooks, manuals and other guidelines as standards they adhered to, one could have concluded that they all understood what standards were all about. That would have perfectly fitted into Avram, McCallum and Price's (1982:197-189) characterisation of standards as varying from exacting technical standards (specifications), through to broadly defined conventions (rules) to most generalised guidelines (models).

As a matter of fact, it could be argued that the standards they claimed to use to preserve archives and making them accessible cannot be considered to be "national" in the true sense of the word because it is evident that they were formulated without any consultation with the South African Bureau of Standards (SABS), the body that is responsible for the preparation and publication of standards in South Africa. Granted, archivists should take the initiative in formulating standards, but they should also establish links with their national standards setting bodies.

Although, the National Archives and Records Service of South Africa (NARSA) was mandated by paragraph (g) of section 3 of the National Archives of South Africa Act 1996, as amended, to establish archival standards in South Africa, the process should be informed by worldwide trends. The coming of the information age makes it imperative for institutions to bear in mind that living in a global village calls for the use of standards that are comparable and portable worldwide, for instance, the use of an international standard such as the general international standard for archival description ISAD(G), described in section 3.3.5.2 of Chapter Three, would promote the exchange of archival information worldwide. According to Guercio (1992), “archivists have hitherto been less aware of any urgent need to standardize their activities, to create information networks, and to exploit the potential of today’s technology”.

In addition to being proactive in terms of formulating standards, archivists in South Africa should use the existing standards for paper used to capture archival documents, for example. Archival institutions in South Africa did not adhere to standards for paper used to capture archival documents such as ISO 11108: 1996 (see Appendix 14). The quality of paper is key to preserving paper-based materials as was demonstrated in section 2.5 of Chapter Two. For instance, the poor quality of paper was highlighted as one of the major problems facing Namibia and South Africa in the 1990s (Avafia 1993:3; Moodley 1993:4). According to Venter (1973) the future of the preservation of archival materials in South Africa lay in using acid-free paper.

In itself, the use of acid-free paper to create archival documents would not help the situation unless the documents were eventually stored in acid-free boxes and suitable shelving at the archives. It was observed during site visits that baked enamel and treated steel were widely used for shelving materials in archival repositories in South Africa. Surprisingly, a very low percentage used acid free archival boxes. All surveyed institutions neither tested storage furniture nor archival storage boxes before using them to ensure that the equipment they used for storing records did not contain potentially destructive substances.

The quality of records that are eventually preserved as archives depends on how they were preserved in the creating departments. Archival institutions monitored the management and

care of records in registries. In fact, five (71.43%) respondents had established standards for the preservation of records in the hands of the creating departments. Interviews revealed that periodic inspections of records in government agencies were carried out depending on the availability of funds. Archives' staff approved registry filing systems. They also conducted training in records management for personnel employed in governments departments. As with preservation, the major drawback has been the acute shortage of staff with professional records management expertise (Directorate State Archives and Heraldic Services 1998-1999:10).

It was encouraging to discover that, although resources to carry out records management activities were limited, archivists in South Africa did not have a custodial mentality in their approach to preserving records and archives. Unlike their Zambian counterparts who were reported in 1992 as only getting involved in the records at their non-current stage (Kukubo & Seabo 1992:41), the South African archivists were involved in the entire life cycle of records generated by government bodies. According to Erlandsson (1997:13) the life cycle of records begin when they are first organised, maintained, and actively used by the creators. The records then go through a number of steps such as use, storage, transfer to inactive storage, and ultimate disposal either by being transferred to the archives or destroyed. South African archivists did not wait to intervene at the end of their life cycle when disposal was imminent.

6.1.2 Legal situation related to the preservation and access to records and archives

Preservation and access largely depend on the laws that govern the definition of public archives, the right to information, the right to privacy, the protection of national security, safeguarding the revenue and maintaining public order. South Africa has legislation that regulates access to and preservation of public records and archives. According to Schwirtlich (1999), legislation is the basis of “our societal framework and archival legislation presents our functions and our organisations as credible and authoritative” and vests them with some power.

Provincial archival legislation in South Africa is modelled on the National Archives of South Africa Act, (Act 43 of 1996) (Kirkwood 2002a:8). Countries with a decentralized system of preserving their national heritage usually have archives laws and regulations formulated and

promulgated for each provinces or each level of local government in accordance with national archives and laws (Dejun 1996:116). Therefore, it is surprising that some provincial archives repositories have taken so long to formulate their own provincial legislation given that the job is almost half done. Indeed, a closer look at the legislation in operation in some provinces shows that there was very little input into the archival laws by those provinces other than just substituting all references to national structures in the law with their local ones, and leaving out those sections that did not apply at provincial level.

Archival legislation in South Africa mentioned the subject of preservation in their preambles, but as Grimard (2000:33) pointed out, “provisions related to preservation are not as explicit as for other archival functions”. In addition, National Archives Regulations of 1997 (see Appendix 13) were silent regarding preservation facilities. One would have expected to find something relating to them in that document if it is assumed that the legislation only provides broad principles and guidelines instead of detailed stipulations concerning policies and procedures. In general, detailed stipulations are more effectively addressed in regulations published in terms of any law.

The National Archives of South Africa Act gives the national archivist the power to arrange, describe and retrieve records. Legislation also authorises the national archives to microfilm or digitise holdings. The same scenario prevails at the provincial level where the provincial archivists more or less have the same mandate. In line with the international norm and the model provided by the International Records Management Trust (1999), the provincial and national archives can deny access to records that are classified as confidential or secret, on the grounds of protecting individual and state interests, even if they would normally have been available for inspection by the public after the 20 - year closure period had expired.

It is evident that on paper, South Africa has one of the most progressive archival laws when compared to other countries in southern Africa. What remains to be seen is whether or not South Africa is going to take advantage of its progressive archival legislation to both preserve archives and make them more accessible. However, the experiences of the South African History Archive (SAHA) in trying to have access to some records relating to the Truth and Reconciliation Commission (TRC) held by NARSA indicated that access to information

contained in some public records and archives was almost impossible (Harris 2003a). It took a threat of a high court action to convince the National Archivist to release the records. In another case relating to records in the custody of NARSA it took nearly 18 months for SAHA to have access to files in the 8/2 series for the period 1960-1980 (Harris 2003b).³⁵ Threat of legal action, and a lot of correspondence, appeared to convince the National Archivist to release the files. Obviously, the implementation of the spirit of archival legislation seems to be rather limited at the moment. The SAHA cases demonstrated that only individuals and organisations with resources were likely to have unfettered access to public records and archives in South Africa.

However, the story of access to records and archives in South Africa would not be complete without a discussion of the Promotion of Access to Information Act (PAIA). PAIA, the piece of legislation to which all other laws dealing with access are subordinate, and which has been in operation since the year 2001, is likely to affect access to, and preservation of records and archives in a profound way. The degree to which archivists understood PAIA, supported its objectives, and were equipped to implement it, was not fully established by the present study because the legislation had not yet been fully implemented.

Some respondents thought the legislation would make records management systems more efficient than before. Procter (2002:48) shared the same view as these respondents on the effects of FOI legislation on records management. Although, her assertion was not based on empirical evidence, she pointed out that:

The Act offers an uncharted, but enticing, territory within which the records manager can shape an organisational information landscape far more compatible with best practice than might have been thought possible in even the recent past (Procter 2002:48).

However, a study carried out by Snell (1993) concluded that FOI legislation does not necessarily lead to improvement in records management. In fact, Snell (1993) pointed out that FOI legislation could hinder access because departments may resort to not recording or storing

³⁵ In the period 1960-1980 the State Archives Service used the 8/2 files for storing any documentation regarded as sensitive. It did not matter what the subject was, or which functional area or activity was involved, if the matter was sensitive then the documentation was placed on the 8/2 files.

information because of potential access under FOI legislation. Thus, the fear of disclosure can lead to the creation of incomplete and incomprehensive records. It remains to be seen whether or not freedom of access legislation is going to promote sound records management systems and enhance access to information held in records and archives. However, what emerged from the literature was that the application of PAIA had been limited, as very few South Africans had used the legislation in order to have access to information (Harris & Hatang 2002). Perhaps SAHA was the only organisation in South Africa that had successfully used the Act in order to have access to public records such as those of the TRC and apartheid military intelligence records (Harris 2002b).

6.1.3 Information technology and the preservation of records and archives

Preserving electronic records remains a significant challenge. As was demonstrated in section 2.6.2.1 of Chapter Two preserving digital records and archives raises a different set of issues to preserving paper records. In contrast to other documentary formats such as paper, where preservation has focussed on the longevity of the object containing information, the advent of electronic records means that archivists and records managers are currently more worried about medium, technology and intellectual preservation (Graham 1994:41; 1998:82).

The preservation landscape has significantly changed with electronic resources increasingly becoming a significant part of society's cultural heritage. Many debates have been advanced regarding the preservation of electronic records. According to Thibodeau (1991:3) it was safer to preserve e-records in an archive than in the active system in which they were created. On the other hand, Bearman (1991:24) asserted that the custodial approach was not tenable in an electronic environment and was an "indefensible bastion and liability". To Bearman (1991) archivists should regulate and audit electronic records systems using metadata standards and record keeping strategies to ensure that agencies created and preserved authentic records. Bearman (1991) suggested that training of records managers and archivists was key to discarding the custodial mentality in relation to the preservation of e-records.

If government departments have a poor track record in preserving paper-based documents, would they be able to manage the additional challenges posed by e-records? Does the answer to that question justify the keeping of e-records in the custody of the creating departments?

There is an ongoing debate around these issues. To Hedstrom (1991) the process of determining the custodianship of e-records between the national or provincial archives should be informed by users' needs. In other words, in establishing the question of custody archival professionals should bear in mind the following questions: Whose needs are met by archival custody? Are the needs better met by leaving the records in the hands of the creating departments? Other issues to be addressed include: What is the cost of transfer into archival custody? What are the implications of intellectual property rights to using licensed software in an archival environment? However, to Duranti (1996:244-245) "defence of the record" is not "possible without custody". It is evident that custody implies archival involvement.

The National Archives and Records Service of South Africa (NARSA) once adopted the custodial approach in the management of electronic records. In 1993 NARSA made a policy decision to accept electronic records for permanent preservation (Directorate of State Archives and Heraldic Services 1993:11). According to two archivists associated with NARSA, studies have convinced NARSA to move towards the non-custodial approach, whereby NARSA would enter into agreements with government bodies about how electronic records would be preserved in their own custody without necessarily transferring them to the archives (Kirkwood & Venter 1999/2000:31). One would imagine that the strategy would apply to the rest of the archive repositories in South Africa, because the NARSA Act empowers the national archive repository to set standards for the management of records and archives in South Africa. Whatever approach is adopted, it is clear that archives in South Africa are ill equipped to preserve electronic records electronically. Figure 12 in the previous chapter showed that the highest level of in-house knowledge available in all the nine surveyed archival institutions for digital preservation activities ranged from novice to intermediate.

It is inconceivable that the archivists would be able to audit e-records management systems as well as train and advise government bodies without the prerequisite skills. NARSA should develop its e-records management capacity rather than solely relying on the expertise they were hoping to tap into from their partnership with the State Information Technology Agency (SITA) (Kirkwood & Venter 1999/2000:33).³⁶ In the researcher's view, information systems

³⁶ SITA's mandate is confined to providing information technology and information system management services whereas the national and provincial archives are concerned with the

people are more worried about processing speeds and real-time delivery of information products rather than the long-term preservation of the resultant information. Thus, any marriage of convenience between systems analysts and archival professionals should be entered into cautiously.

It seems that the strategy of leaving e-records in the custody of creating departments has not been fully implemented because three archival institutions had digital materials in their custody. One wonders how these institutions managed their e-records since the capacity to store electronic records was limited to Pretoria (Directorate State Archives and Heraldic Services 1999-2000:11).

The few archival institutions that had e-records in their custody accepted them in any format. Hunter (2000:63) warned that choosing a stable file format is one of the four keys in ensuring the longevity of e-records. Hunter (2000:60) recommended the use of the American Standard Code for Information Interchange (ASCII) files for word processed documents and formats popular on the World Wide Web such as Extensible Markup Language (XML), Hyper Text Markup Language (HTML) and Adobe Portable Document Format (PDF). Only two institutions used the ASCII file formats for the e-records they generated during their operations. The findings revealed that records from creating departments were stored as received.

It is evident that the surveyed institutions relied on what Brindley (2000) called “benign neglect” as a preservation option. Technological obsolescence had caught up with two archival institutions that had digital materials in their holdings for which they lacked the operational and/or technical capacity to mount, read, and access. No archival institution had an established method for preserving digital materials. However, they used guidelines for managing electronic records issued by the National Archives and Records Service of South Africa (National Archives of South Africa 2000b).

proper care and preservation of public records contained in information systems in the public sector.

The problem with the guidelines is that they are too theoretical and serve as a why-to-do-it manual rather than a more practical how-to-do-it guide (Kirkwood & Venter: 1999/2000:38; Ngulube 2002b:34). The informants pointed out that the guidelines were neither modular nor comprehensive, and were difficult to implement. It is hoped that the ongoing process of revising the guidelines would take into account some of the concerns raised by the informants.

According to Table 22 in the previous chapter, two archival institutions revealed that technological obsolescence and insufficient resources for preservation were the greatest threat to their e-records. It is surprising that only one institution refreshed its digital materials, and that neither of the two reporting institutions migrated their digital materials, given that technological obsolescence was one of the greatest threats to the preservation of their e-records. According to Hedstrom (1997:184):

Archival preservation of digital materials requires a permanent, system-independent, and computer processible medium. As long as the terms 'system-independent' and 'computer-processible' remain mutually exclusive, archives and libraries must accept migration rather than permanence as the key to preservation in the digital environment.

Of equally concern in relation to strategies for preserving e-records was the fact that all surveyed institutions could not estimate the quantity of digital materials for which they had preservation responsibility. One of the questions that beg an answer is: How does one allocate resources without knowing exactly what is at hand? If digital preservation is not dealt with effectively, there will be no national and provincial archives of South Africa for the digital age.

Perhaps lack of expertise in digital preservation partly explains the unsatisfactory state of affairs in the preservation of digital materials in South Africa. The Directorate of State Archives and Heraldic Services (1999-2000:21) underscored NARSA's lack of expertise in the area of electronic records keeping. It is no wonder that according to Figure 14, additional training in electronic records is needed by 88.89% of the responding institutions, and Figure 15 shows that 55.56% required additional training in e-records at a basic level with 22.22% requiring it at intermediate and advanced levels.

The need for expertise in managing digital resources was identified in a study for the Research Libraries Group (RLG) as a major factor in the successful management of digital materials (Hedstrom & Montgomery 1998). According to Ngulube (2002b:31) expertise in the field of digital preservation in southern Africa was very limited. In contrast to the Netherlands, where van der Werf (2002:54) reported that the understanding of the issues surrounding digital preservation was growing at a reassuring rate, South Africa did not have a satisfactory national strategy to deal with digital materials and their preservation. As Pickover and Harris (2001) stated, an effective programme for preserving the long-term electronic memory of the state in South Africa still remained out of reach. The two further pointed out that most organisations in South Africa were not geared to providing public access to their records.

Training is one of the keys to getting expertise in digital preservation. Lack of trained staff in the preservation of e-records is likely to erode the few strides that South African archivists and records managers have made so far in preserving their national heritage. Kemoni and Wamukoya (2000:134) also identified lack of information (IT) skills due to inadequate training as one of the impediments to the management of electronic records at Moi University in Kenya.

The next section elaborates on the need for skills and experience in preserving records and archives.

6.1.4 Level of skills and experience in preservation management in South Africa

According to Lyall (1994:263) the level of knowledge in a country is one of the four major factors that determine the ability of any country to develop a satisfactory preservation programme. Analysis of data in Table 25 shows that most of the 21 staff members who were directly involved in preservation and conservation activities might not have been trained in major conservation processes such as deacidification, microfilming, digital preservation, developing and implementing preventive and handling procedures and developing conservation-restoration programmes or surveys. Seven (33.33%) had training in digital preservation as compared with a mere 4.76% with training in microfilming. In fact, only three institutions reported that personnel carrying out preservation activities were trained in preservation techniques.

It is very difficult to escape the conclusion that there is a critical shortage of staff with expertise to preserve records and archives in South Africa. From 1995 to 2000 the National Archives Repository, which had the only properly equipped restoration unit, had two staff members without specialist expertise (Directorate of State Archives and Heraldic Services 1995-1997:15; 1999-2000:15). The critical shortages of staff are not peculiar to South African archival institutions. At one point, the National Archives of Namibia operated with only one professionally qualified staff member (Barata, Kutzner & Wamukoya 2001:39). A study by COSHRC (1998) confirmed that the problem was also experienced from time to time in other parts of the world. The UK faced the same crisis in the late 1950s and early 1960s when it was difficult to get staff capable of preserving documentary materials (Rhys-Lewis 1999:157).

Among the respondents in the current study, the greatest number of people involved in archival work was trained in South Africa. A small number had graduate degrees in history or information studies. Staff with graduate degrees in archival administration was fairly rare as it was reported by only 4.76% of the repositories. The problem with receiving local training was that it was bound to be inadequate because archival preservation education in South Africa was described as grossly underdeveloped (Abbot 2001:65; Kangulu 2000:35; Ngulube 2001c:156; Stabbins 1998).

A study by Ngulube (2001c:171) demonstrated that the institutions that offered archival training at a tertiary level in South Africa were the Rand Afrikaans University, Technikon SA, the University of Natal, the University of South Africa and the University of the Witwatersrand. The study further revealed that at the time only the Technikon SA and the University of Natal offered modules specifically addressing preservation and conservation issues in archives. Murray (2002:vii) confirmed the fact that, “current course and module offerings at universities and Technikon teaching departments do not cover the essential preservation issues adequately”.

Data presented in Table 26 and Figure 13 show that the level of expertise in preserving e-records and microfilming is very low. Skills in these two areas are increasingly becoming important because of pressures created by deteriorating paper and growing demand for more access. In fact, 42.86% of the surveyed institutions reported that some records and archives in

their holdings had deteriorated beyond use (see Table 19). Microfilming and digitisation could be used to create copies of documents in high demand and thus deflecting use from the originals. The two strategies can enhance access to records by making copies widely available. It is important that individuals charged with managing archives and records are familiar with such reformatting strategies.

It is evident from the data collected through questionnaires and interviews that assumptions about the nature and scope of preservation and access varied widely. Staff members seem to be familiar with preservation functions such as boxing, and shelving. However, data presented in Table 26 show that there were inadequate skills and knowledge about basic preservation issues like environmental control, care and handling, reformatting, preservation planning, and disaster management and security.³⁷ It is encouraging to discover that the respondents seemed to be aware of their limitations when it came to the preservation of documentary materials. Hence, almost all archival institutions expressed interest in improving skills in that area. The level of training they required was predominantly either basic and/or advanced.

There was strong interest in training through a variety of modes. Training is important because it provides the learners with the knowledge and skills and attitudes to carry out specific tasks and activities (Thapisa 1999:91). To Jain (1999:283), “well-trained individuals know the scope, expectations and depth of their jobs and will be able to add building blocks to their professionalism as they progress through their careers”. According to Smith (2000:2) training and development was one of the three major issues that have been common themes throughout the discussions, seminars and workshops that have been held in South Africa in recent years.

Training can be provided through a variety of modes. Respondents seemed to favour on-the-job training followed by workshops on archival techniques. The third preferred mode of training was graduate courses in archival administration, training by institutes on archival methods, archival consultant services and recourse to printed training manuals. Internships were rated low, yet they can be very useful in gaining hands-on experience for personnel involved in the technical side of preservation. The fact that archival institutions in South Africa neither conducted research relating to conservation and restoration nor disseminated

³⁷ A detailed list of basic preservation skills is at Appendix 10.

information gained from examination, treatment or research on the preservation of records and archives could be partly explained by their lack of advanced preservation knowledge and skills.

Library and information science research in general and research relating to the preservation of records and archives in particular, is essential to improve skills and knowledge of the practitioners. According to Powell, Baker and Mika (2002:49) research by LIS professionals was needed to create knowledge and improve problem solving and decision-making in the workplace. In that regard, Swisher (1986:177) pointed out that the responsibility of practical research is probably the most important role library and information practitioners can accept. Lack of research in the LIS field was not confined to South African archive repositories. In fact, many practitioners rarely conducted applied research (Powell, Baker and Mika 2002:50).

6.1.5 Information technology and access to public records and archives in South Africa

Information technology (IT) has brought about radical changes in the way that information is captured, stored, retrieved and disseminated. Information professionals are taking stock of their place in the management of information resources. The major concern is whether or not IT is going to enhance access and utilisation of information. Archival professionals have not been left behind in terms of utilising ICTs to provide repackaged information to their users.

While the archival repositories in South Africa indicated tremendous interest and demand for training in the use of computers in archives, only three (42.86%) used a local computer catalogue to provide access to their collections, five (71.43%) used the Internet to give general information about the archives, four (57.14%) provided links to other archives, and five (71.43%) used the World Wide Web to provide access to descriptive databases. Given the rate of integration of the computer into the management of public records and archives in South Africa, these figures should be much higher.

Nonetheless, archivists in South African repositories have been using computer-based technologies to provide access to their holdings since the 1970s. For the most part they have created automated tools that described the records in their custody. Over time, these have

evolved from strictly being local stand-alone and become a web-enabled National Automated Archival Information Retrieval System (NAAIRS) that is accessible over the Internet.

It remains to be seen whether or not electronic access tools would enable much broader access to public archival holdings in South Africa, initially through descriptive inventories and indexes, and eventually through electronic delivery of documents themselves, enabling users to search the full text of archival documents from their homes or offices and retrieve the information they need without ever going to the archives reference room. The fact that only finding aids are available over the Internet led Rose (2001:7) to conclude that national archives in South Africa were not yet available to the public as technological enthusiasts would lead us to believe.

At this juncture it is important to pause and reflect on a question once posed by Kirkwood (2002b:1), an archivist associated with NARSA: Is web-enabled NAAIRS achieving its purpose? To answer this question it is necessary to delve into the debate on the pros and cons of the impact of information and communication technologies on access to information in general, and records and archives in particular.

Many information society enthusiasts, both academics and policy makers, claim that the use of ICTs will improve access to information. Dissident voices suggest that the application of ICTs could be a barrier to access and caution against the technological determinism approach that equates technological advancement with social progress without taking into consideration the political, social and economic dynamics of individuals, countries and organisations (Burton 2002:43; Henwood *et al.* 2000:9-11). In fact, according to Loader (1998:15):

The development of the information society is not likely to be characterized by a linear technological progression, but rather through the competing forces of innovation, competitive advantage, human agency and social resistance (cited in Henwood *et al.* 2000:15).

Britz (1998:18) pointed out that people who are computer illiterate can also be excluded from access to information which is only available in electronic format and for a government to make information exclusively available on the Internet with the assumption that it would be accessible to everyone, was very misleading.

In that regard, Pimlott (2000:87) pointed out that before we think of whether or not we are in the “information society” or living in an “information age” or in the midst of a “technological revolution” we should think of inequalities in life. To Henwood and others (2000:6), access to and ownership of telephones, television, computers and Internet accounts can all be considered to be indicators of inequality within and between social groups. The inequalities of the “information age” and the “post industrial society” are bound to be a barrier to accessing information using information and communication technologies. Even if archivists and records managers should embrace “information technology as a tool that can enhance exploitation of archival information”, as Kemoni, Wamukoya and Kiplang'at (2003) argued, they should always bear in mind the ‘technological haves nots’ who constitute the majority in the African context.

Before we can reach the conclusion that NAAIRS “has made significant contributions towards the transformational imperatives of making archives known and promoting their use by the public at large” as Kirkwood (2002b:5) would lead us to believe, we must take the inequalities that have been highlighted in the preceding paragraphs into consideration. The statistics quoted by Kirkwood (2002b:2) cannot speak for themselves in reflecting the extent of public use because as he confessed the tracking system that helps to keep count of the visitors to the website was anonymous and “cannot identify the name or network address of a user” (Kirkwood 2002b:2). The statistics used to show that NAAIRS has been successful do not tell us whether or not the researchers were South Africans. It could very well be that the visitors to the website were overseas researchers or the same researchers visiting the website several times irrespective of their countries of origin. One wonders how Kirkwood (2002b:5) came to the conclusion that “web-enablement has indeed assisted in developing a new base of users of archives” on the basis of the statistics he used.

It is difficult to sustain the argument that ICTs have had a positive impact on access to records and archives in South Africa on the basis of the assessment of Kirkwood (2002b). The social and political realities in South Africa do not seem to support such a thesis. The apartheid system of education contributed to high illiteracy levels among Africans. Educating Africans, who constituted the majority of the population of South Africa, was deliberately given a low priority (Kriger 2000:149).

In addition, the NAAIRS system had limited data on former historically disadvantaged people of South Africa. Kammie Kamedien (2001) of Cape Town in South Africa succinctly pointed out that:

the NAAIRS system still does not do justice to community-based genealogists researching black family histories. The legacy of giving preference to Afrikaner and English speaking South African records is still built into your new NAAIRS system. Our family found several entries in the manual death notice registers, but there seems to be little proof of our family's existence on the electronic records system of the Cape Archives. Much more money needs to be invested in transforming the past imbalances built into your present system of record keeping. The continued marginalisation of our historically disadvantaged communities currently in the archive system requires improved management and client driven customer delivery products (cited in Kirkwood 2002b:10).

We cannot conclude that ICTs have effectively addressed the problem of access to information contained in archives and records in South Africa without taking the imbalances mentioned in the above quotation into consideration.

6.1.6 Steps that have been undertaken to safeguard records and archives

Many archival repositories in South Africa appreciated that something must be done to safeguard records and archives into the future. Some workshops on preservation were conducted at a few archives repositories by the researcher during the time of data collection. A national conference and workshop was also convened at the University of Natal from 10 to 13 December 2002. The conference proceedings, to be published as a special issue of the S.A. Archives Journal will add to the preservation discourse, particularly in South Africa.

The Society of South African Archivists has also organised workshops and conferences on access to records and archives, and the preservation of electronic and video formats. The workshops and conferences were aimed at raising awareness of the importance of safeguarding records and archives and making them available for use. Barata, Kutzner and Wamukoya (2001:42) underscored the importance of awareness raising as key to the successful management of electronic records in SSA. According to Foot (2000:35) without raising awareness on the importance of preservation programmes to stakeholders it would be

inconceivable to implement a preservation agenda. There is need to lobby for greater acceptance of the importance of maintaining the national recorded heritage for the use and enjoyment of future generations and for the funding necessary to ensure it.

The awareness raising activities seem to have had some impact. Preservation has been formalized as a separate section in two archival institutions. Preservation was reported to be receiving a lot of management support at the highest level at one of the archival institutions. Public programming, which is discussed in the ensuing sections, is also one way of raising the profile of archival programmes.

6.1.7 Access to information contained in public records and archives

The current emphasis in the management of public records and archives in South Africa is on access and use, and the need to raise awareness about the functions and activities of archives among the public. In providing access to the contents of records and archives, it is important for archivists to balance the interests of the users with the need to safeguard records and archives to facilitate their ongoing preservation on one hand. As Duchein (1983:45) pointed out, “the archives are part of the heritage of a country and concern for making them accessible should not lead to jeopardising their very existence”. On the other hand, legal requirements and the protection of privacy should be balanced with access interests.

The national and provincial archives legislation prevailing in South Africa provides for records deposited with archives repositories to be made available to the public, unless legal grounds or access conditions require the records to be withheld. In addition to legal requirements, access to the contents of records and archives could be governed by the existence of finding aids, rules of access, equipment to facilitate access and the knowledge of the existence of the holdings. These factors are briefly discussed below.

The figures in Table 32 show a phenomenal growth in the number of people visiting archives in South Africa as compared to Botswana, Malawi Swaziland and Zimbabwe. South Africa seems to be doing better than some of its counterparts in southern Africa in terms of attracting visitors to the reading rooms at some of its archives repositories. Perhaps, the growth in the number of visitors to archive repositories in South Africa could be partly attributed to the

success of their outreach programmes. What remains to be done is an evaluative exercise to find out the extent to which outreach programmes have been behind the phenomenal growth of visitors or users. There is need to identify who the actual users of the archives are. User studies should also try to answer the following questions: Are the numbers of researchers increasing in real terms or are archives serving the same clientele who come to the repositories regularly?

The need for user studies becomes very critical if one considers the fact that in 1996 over 90% of the users of archival services in South Africa were white genealogists (Callinicos and Odendaal 1996:42). In a recent study on access and outreach activities at the archives in KwaZulu-Natal Province, Koopman (2002) concluded that access to archives was still limited to a few researchers.

Outreach and public programming remain major keys to promoting and encouraging the use of services by users. According to Kaniki (1992:84) the availability of information is not adequate to ensure its access and use. In that regard, Ngulube (1999:19) argued that:

It should be appreciated that information, no matter how well organised and indexed, does not realize its value until it is used. There is a strong feeling that greater attention needs to be given to marketing because it addresses the demand side of any type of information system and leads to user awareness and the need to utilize.

Kemoni, Wamukoya and Kiplang'at (2003) also pointed out that archival professionals should create and maintain awareness of the information services they offer through marketing. Marketing is part and parcel of outreach and public programming. The variation in the use of these terms largely depends on where one is coming from.

Archivists in the post-custodial era should widen their horizons and look beyond their gardens, as Ericson (1990-91) would say, so that they have a full picture of the social and historical environment in which they operate (Ham cited in Ericson 1990-91:115). Archivists should reach out to their users. In other words, they should not confine themselves to the traditional custodial tasks of appraising, selecting, processing, preserving and giving reference services (Harris 2000b:24). They should use publicity campaigns and public relations exercises to influence the public's use of archives and records. As shown in Table 33, archival institutions

in South Africa mostly used group visits and conducted tours (85.71%), exhibitions (71.43%) and workshops and seminars (71.43%) for their outreach programmes. It was evident from the interviews with some of the respondents that these programmes have not been evaluated to assess their effectiveness.

It was unfortunate that only one archival repository had a written public programming plan. The plans should be informed by an analysis of users' interests and needs at regular intervals. Analysis of user needs does not seem to be the hallmark of archival practice in archival repositories in South Africa. Slightly over half (57.14%) of the surveyed archival institutions carried out user studies on a regular basis. In another study, Ngulube (1999:22) discovered that out of the 11 surveyed archival institutions in the ESARBICA region two (18%) carried out user studies more than once a year, two carried them once a year, three (27%) did it irregularly and four never carried them out. User studies are key to understanding the information needs of the clientele that the archival professionals serve. To Ketelaar (1992:15):

Making our archives into archives of the people, by the people, for the people is only possible when we know our people, listen to our people, and serve our people.

In that regard, archivists should develop outreach plans based on well-known user needs in order to effectively relate to their publics. The plans could be used to measure performance and in the allocation of resources. The existence of outreach plans will also ensure that outreach work would be incorporated into other archival functions (Blais and Enns 1990/91:101). According to Ericson (1990/91:115), “[s]ecurity and conservation measures ensure that historical records will be preserved so that they can be used. Outreach ensures that they are used”. Lack of awareness of the existence of information can be a major barrier to it. The other barriers to access such as language, lack of finding aids and equipment, and rules of access to records and archives are discussed below.

The role of language in the provision of access should not be ignored. Language and the level of education of the majority of South Africans have remained what Wilson (1991) referred to as “systemic” barriers to access. Systemic barriers such as language and level of literacy can prevent people from having access to archives even if they are preserved. Illiterate or semi-literate people can be denied access to information that is in textual format. This problem is

pertinent to South Africa because of the high rate of illiteracy (Kriger 2000:149). If a person were unable to comprehend a specific language it means that even if the information were available it would not be accessible to that person. Interviews confirmed that most of the findings aids were still in English and Afrikaans. Little has been done to translate them into the other nine official languages to make them more accessible. In one of its recommendations, the Truth and Reconciliation Commission of South Africa (2003a:729) underscored the use of a language that was accessible to the majority of South Africans in the provision of information managed and maintained by the National Archives and Records Service of South Africa³⁸.

Finding aids are key to making the contents of archives available to the public (Uduigwome 1989:25). Access tools such as inventories, indexes, catalogues, and other descriptors make records and archives retrievable. Repositories in South Africa did not have a uniform approach in creating these tools. One archival institution reported that less than 25% of its records and archives were described in one or more of the most common finding aids listed in Table 29. Three (42.86%) respondents had 50% to 74% of their records and archives described in the finding aids. The remaining three institutions had between 75% and 100% of their records and archives described in the finding aids.

There were instances in South Africa where lack of indexes or other finding aids and unprocessed backlogs were identified as major impediments to using public records and archives. For instance, one respondent cited lack of indexes or other finding aids as a major impediment to accessing records and archives in South Africa and the other mentioned processing backlogs as one of the barriers to accessing information contained in records that would otherwise be available for use in terms of the archival legislation. Processing backlogs was also cited as a prevalent problem in the UK (Historical Manuscripts Commission 1999).

³⁸ The Truth and Reconciliation Commission (TRC) was established in 1995 to investigate and establish a complete picture of the nature, causes and extent of gross violations of human rights committed during the apartheid era in South Africa. According to Dullah Omar, former Minister of Justice the TRC was established to enable South Africans to come to terms with their past on a morally accepted basis and to advance the cause of reconciliation (Truth and Reconciliation Commission of South Africa 2003b).

Some records and archives were not open for use in certain archival institutions, not because of lack of finding aids, but because of legal restrictions governing access. However, only three (48.86%) of the participating institutions communicated to users the processes for requesting special access to restricted archival materials. Rules governing access should be available in order to possibly facilitate access even to those records that are not open to public inspection. Rules governing access and the use of materials should be available to all users so that the information contained in archives and records would be effectively utilised. In fact, to Archives New Zealand (2001):

The access provider should clearly distinguish, for users, which records are available for public access and which are restricted in consideration of legal and other requirements. Users should be informed of processes for special access to restricted records.

Users were said to be aware of their obligation to comply with copyright legislation and access conditions when using information contained in records and archives at five (71.43%) archival institutions. Guidelines for citation should also be provided. Citation guidelines and processes for permission to publish information from records and archives were communicated to users at four (57.14%) archival institutions. According to Jo Pugh (1992:62) clear and accurate citations are key to facilitate on going access to materials because researchers use footnotes or references in other publications to guide their own research work.

Staff providing access to records and archives were fully trained for their jobs in five (71.43%) out of the seven archival institutions. It would be necessary to train all staff members who deal with access issues in order to enhance their capacity to provide an efficient service. That would go a long way towards ensuring that the quality of service would be standardized and beneficial to the user. It is encouraging to discover that reading room rules and handling guidelines were communicated to the users at six (85.71%) archival institutions. Only one institution communicated them both in writing and verbally and three did it verbally. In order to overcome problems of inconsistencies in explaining and applying the rules it is advisable to have them written down and only communicate them verbally when it is absolutely necessary.

Ideally, the rules should be communicated to the users before use if the materials are going to be handled and used properly. Communicating the rule to users briefly during use as was done at four (57.14%) archival institutions could be detrimental to the safety and handling of materials. Damage to documents is likely to be caused by uninformed users.

Services for copying records and archives in accordance with legal obligations and conditions of access were widely available. Photocopiers (85.71%), microfilm readers (57.14%) and computers (71.43%) were widely used to facilitate access to archives and records in South Africa. Archival repositories without the necessary technology and equipment should address the issue as a matter of urgency so that lack of equipment would not be a barrier to accessing information. In fact, three (42.86%) out of the seven archival repositories did not have sufficient physical and technical equipment to facilitate easy and safe access to all types of records in their holdings. Lack of equipment such as microfilm readers and tape players were cited as some of the impediments to accessing information contained in public records and archives.

6.2 SUMMARY

This chapter examined and analysed data relating to preserving and making public records and archives available to users in South Africa. It is evident that archival institutions that were surveyed were deeply concerned with the protection of their holdings for current and future use. Increasing funding, encouraging greater use of holdings, preservation of collections, increasing the visibility of or public support for archives and records programmes and improving staff expertise were among the major issues raised by the respondents in relation to managing records and archives and making them available for use. However, a number of daunting challenges have to be contended with before the preservation of public records and archives, and making them available for use by the present and future generations, reaches satisfactory levels.

Some of the challenges and opportunities that were identified by the present study were:

- preservation activities were highly underdeveloped in many provincial repositories;
- the state of preservation of, and access to public records and archives in many provincial repositories was highly unsatisfactory;

- archival institutions in some provinces did not have the required infrastructure to preserve records and make them accessible;
- some provinces did not have archival legislation to use as a framework to establish provincial archive services;
- archival repositories did not have clearly articulated mission statements;
- archival repositories lacked written preservation policies;
- funding, lack of key personnel and commitment to the preservation cause were cited as some of the factors that inhibited the success of preservation policies;
- preservation activities were given a low priority;
- collaboration between institutions preserving South Africa's cultural heritage was very limited;
- Most (71.43%) archival institutions controlled temperature and relative humidity in repositories where records and archives were stored;
- temperature and humidity levels in storage areas were rarely monitored;
- HVAC systems were threatened by technological obsolescence in some archival repositories in South Africa;
- records and archives were prone to deterioration through photochemical reaction because light was not controlled in archival repositories;
- archival institutions in South Africa checked new accessions before they entered their repositories, although they rarely disinfected them;
- spraying and fumigation were the two major methods that respondents used to exterminate pests;
- most of the chemicals used to control pests in archival institutions in South Africa were a potential human hazard;
- archival institutions in South Africa had not incorporated testing of the equipment they use to store records into their archival practices;
- records storage places in archival repositories in South Africa were generally clean;
- more than half of the archival institutions trained staff and users in the proper handling of documentary materials;

- although, five archival institutions had space available or allocated for future expansion of their archival storage, only three out of all the surveyed archival repositories had adequate space for shelving and storage of records and archives;
- disaster preparedness as a document preservation strategy was a neglected area in archival institutions in South Africa;
- the security of records in archives repositories in South Africa can be guaranteed within reasonable limits;
- expertise in audiovisual preservation was limited in South Africa;
- poor handling, acidity, mould and insects were causing the deterioration of records and archives in South Africa;
- use of preservation techniques such as deacidification and microfilm was very limited;
- microfilming equipment and skills in microfilming were sparse;
- the use of standards in preserving and making records and archives available for use was rather limited;
- at a conceptual level, respondents did not seem to fully understand what standards were;
- archivists and records managers were involved in the entire life cycle of records generated by government bodies;
- South Africa had one of the most progressive archival laws when compared to other countries in southern Africa;
- some provincial archival repositories did not have their own archival legal framework;
- the application of the Promotion of Access to Information Act (PAIA) had been limited as very few South Africans used the legislation, and its impact on records management and access to information remains to be seen;
- national and provincial archives legislation prevailing in South Africa provided for records deposited with archives repositories to be made available to the public, unless legal grounds or access conditions required the records to be withheld;
- some records and archives were not open for use in certain archival institutions because of legal restrictions governing access;
- archival repositories in South Africa were ill equipped to preserve electronic records electronically;

- all surveyed institutions could not estimate the quantity of digital materials for which they had preservation responsibility over;
- many staff members who were directly involved in preservation and conservation activities were not trained in major conservation processes;
- there was a critical shortage of staff with expertise to preserve records and archives in South Africa;
- Some (42.86%) of the surveyed institutions reported that some records and archives in their holdings had deteriorated beyond use;
- there were inadequate skills and knowledge regarding basic preservation issues;
- there was strong interest in training through a variety of modes;
- public records and archives in South Africa were not yet widely available to the public as a result of the use of ICTs;
- workshops and conferences were convened to raise awareness of the dilemma faced by archivists and records managers in relation to the deteriorating cultural patrimony;
- public programming activities seemed effective, although the programmes have not been evaluated to assess their effectiveness;
- analysis of user needs did not seem to be the hallmark of archival practice in archival repositories in South Africa;
- language, lack of finding aids and processing backlogs were identified as some of the barriers to accessing information contained in records and archives;
- reading room rules and handling guidelines were communicated to the users at six (85.71%) archival institutions; and
- photocopiers (85.71%), microfilm readers (57.14%) and computers (71.43%) were widely used to facilitate access to archives and records in South Africa.

Some of the major findings outlined above are summarized in the next chapter.

CHAPTER SEVEN: SUMMARY OF STUDY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

I may have gone astray at many points ...It is up to others to try to do better. My one hope is that I have made the reader feel both the reality, difficulty, and urgency of the problem and, at the same time, the scale and form which the solution cannot escape. (De Chardin 1975:290)

7.0 INTRODUCTION

On the basis of the data presented and interpreted in the two previous chapters, and the research experience gained during the conduct of the project, this chapter is concerned with giving a summary of the findings, conclusions and recommendations of the study. The previous two chapters described and explained the nature and dimensions of the preservation problem that was uncovered by the research. The description showed us what the units of analysis shared in common and what made them distinctive from one another.

7.1 SUMMARY OF THE STUDY FINDINGS

The research revealed that the South African national archival heritage consisted of a variety of documentary formats. Although archival institutions that were surveyed were deeply committed to protecting their holdings for current and future use, they did not uniformly address the preservation challenge. They did not provide total preservation care because the common elements of preservation programmes such as environmental control and monitoring, handling and use of materials, reformatting, disaster preparedness, preservation planning and policies, security, storage of archives and records, treating selected materials, conducting preservation surveys and holding maintenance were addressed in varying degrees by archival repositories in South Africa.

Records and archives have deteriorated as a result of poor handling, acidity, mould and insects. A lot of archival materials are already on acidic paper, yet conservation processes such as deacidification, microfilming and digitisation were not widely used in the South African archival landscape. Many institutions did not have the capacity to carry out microfilming and deacidification activities.

Funding and lack of key personnel inhibited implementing preservation activities. Dedicated funding lines for preservation activities were very difficult to establish in many archival institutions and it was not clear as to how and to what degree preservation was funded in most of the institutions that were surveyed. The problem of preserving archives and records was compounded by the fact that there were no conservation facilities in most archival institutions in South Africa. Resource sharing and collaboration among archival institutions in South Africa and other heritage institutions such as art galleries, libraries and museums was very limited. In addition, archival institutions in South Africa did not adequately co-operate with regional and national organisations concerned with the preservation of documentary materials. The problem of skills development was compounded by the fact that the provision of archival education in South Africa in general, and preservation education in particular, was grossly inadequate.

The level of expertise in dealing with preservation issues relating to documentary materials was relatively low. Most of the staff members who were directly involved in preservation and conservation activities were not trained in major conservation processes such as deacidification, microfilming, digital preservation, developing and implementing preventive and handling procedures and developing conservation-restoration programmes or surveys. There were inadequate skills and knowledge about basic preservation issues like environmental control, care and handling, reformatting, preservation planning, and disaster management and security.

The level of training in preservation management that the staff required was predominantly basic and advanced. Methods of training favoured by the respondents varied from on-the-job training to graduate courses in archival administration. Other respondents preferred printed training manuals to internships and workshops. Archival institutions in South Africa neither conducted research relating to conservation and restoration nor disseminated information gained from examination, treatment or research on the preservation of records and archives.

Preservation activities were highly underdeveloped in many provincial repositories. As a result the state of preservation of, and access to public records and archives was highly unsatisfactory. Archival legislation for use as a framework to establish a provincial archives

service was nonexistent in some provinces. Archives in most provinces were accommodated in adapted and inappropriate buildings. However, 57.14% of the archival institutions in South Africa maintained their buildings in varying frequencies. Archival storage space was reported to be running out in most archival repositories in South Africa.

Temperature, light and RH were controlled in most of the archival repositories. However, HVAC systems used to control temperature and RH were threatened by technological obsolescence. Archivists and records managers were not familiar with the brand names of fire suppression and detection systems used in their repositories. Most of the surveyed repositories did not closely work with their local fire departments. Chemicals were chiefly used to control biological agents in archival repositories. Many of the chemical products used were injurious to human beings. Preservation standards were not applied consistently. In addition, their use was rather limited.

The number of users visiting archival institutions was rising. Photocopiers (85.71%), microfilm readers (57.14%) and computers (71.43%) were widely used to facilitate access to archives and records in South Africa. Users carried out photocopying frequently without staff supervision. Services for copying records and archives in accordance with legal obligations and conditions of access were widely available. Users and staff were trained and given guidelines on the handling of archival materials. Staff providing access to records and archives was fully trained for their jobs in five (71.43%) out of the seven archival institutions. Reading room rules and handling guidelines were communicated to the users at six (85.71%) archival institutions.

Disaster planning which is regarded as an essential part of preservation programmes was lacking. Only one archival repository seemed to have a written disaster preparedness plan dealing with records and archives. Preservation policies were scant. At a conceptual level, respondents did not seem to fully understand what standards and mission statements were. All surveyed institutions neither tested storage furniture nor archival storage boxes before using them to ensure that the equipment they used for storing records did not contain any seeds of destruction. Preservation programmes were generally reported to be unsuccessful. In addition,

preservation of records and archives had received a low priority. In a nutshell, preservation had not received the attention it deserved over the years.

The National Archives of South Africa Act, as amended, the Promotion of Access to Information Act (PAIA) and various provincial archival laws regulate access to records and archives. The national and provincial archives legislation prevailing in South Africa provided for records deposited with archives repositories to be made available to the public, unless legal grounds or access conditions required the records to be withheld. Archival legislation also gave the national and provincial archives a mandate to monitor the management and care of records in registries. Archival institutions in South Africa have used archival legislation to manage public records throughout their entire life cycle. The effect of PAIA on managing and making records and archives accessible had been very limited.

Electronic resources are increasingly becoming a significant part of South Africa's documentary heritage. Lack of trained staff in the preservation of e-records is likely to erode the few strides that South African archivists and records managers have made so far in preserving their national heritage. Technological obsolescence was one of the greatest threats to the preservation of e-records. Few archival institutions had e-records over which they assumed responsibility for their preservation. NARSA is planning to adopt a non-custodial approach in the management of e-records. In practice, NARSA would enter into agreements with government bodies on how e-records would be preserved in their own custody without necessarily transferring them to the archives. Very few archival institutions stored records in stable file formats such as ASCII. Records from creating departments were stored as received. Migration strategies were not widely used. Guidelines used for managing electronic records were inadequate. Expertise in dealing with digital materials was very limited. The use of ICTs in providing access to information contained in records and archives was still at a nascent stage. Some finding aids have been automated, but they did not cover a wide spectrum of South Africa's archival resources in relation to the racial realities of the South African society. In addition, the majority of South African did not have access to NAAIRS, the archival automated information retrieval system.

Language, lack of finding aids and equipment, and rules of access to records and archives were identified as some of the barriers to accessing information contained in public records and archives in South Africa. High levels of illiteracy and the fact that most findings aids were still in English and Afrikaans were identified as some of the barriers to accessing information. Repositories in South Africa did not have a uniform approach in creating finding aids. Only three institutions had between 75% and 100% of their records and archives described in the finding aids. There were instances where lack of indexes or other finding aids and processing backlogs were identified as major impediments to using public records and archives. Lack of equipment such as microfilm readers and tape players were cited as some of the impediments to accessing information contained in public records and archives.

Some records and archives were not open for use in certain archival institutions. Rules governing access and the use of restricted materials were not uniformly communicated to users. Citation guidelines and processes for permission to publish information from records and archives were communicated to users at four (57.14%) archival institutions.

Some steps have been taken to safeguard public records and archives. Workshops and conferences have been held at the initiatives of individuals, and professional associations such as the Society of South African Archivists. Awareness raising activities were also achieved through public programming. Public programming was widely accepted in the archival circles in South Africa as part and parcel of sound archival management and the law backs the acknowledgment. Although, written public programming policies were hard to come by, archival institutions in South Africa mostly used group visits and conducted tours (85.71%), exhibitions (71.43%) and workshops and seminars (71.43%) for their outreach programmes.

7.2 CONCLUSIONS ABOUT RESEARCH ISSUES

Public records and archives in South Africa are in grave danger of being lost and becoming inaccessible. Access to public records and archives in South Africa is diminishing rapidly largely due to inadequate preservation strategies and a dearth of knowledge of archival preservation techniques. In a nutshell, for South Africa to overcome the impending preservation crisis there is need for adequate funding, staff training, environmental control in records storage places, standards for preservation and access, research and development, and

preservation planning. Conclusions about each research issue are given in the following sections.

7.2.1 Conclusions about activities and strategies used in the preservation of records and archives in South Africa

Public records and archives were not properly maintained. Many archival institutions in South Africa did not have purpose built repositories. Examination of records was rarely done. Conservation and restoration activities were very limited. Records and archives were not adequately protected from environmental hazards such as temperature, relative humidity and light. In addition, they were not satisfactorily protected against physical dangers such as media instability and fragility. Photocopying guidelines were not clear and their application varied from repository to repository.

Records and archives are vulnerable to a variety of disasters such as insects, rodents, mould, humidity, power outages, leaking roof and pipes, sprinkler discharges, arson, bomb threats, and acts of war and terrorism. There is an ever-present danger that disasters may endanger buildings and holdings. Nevertheless, disaster preparedness and security of records and archives did not form a significant part of the preservation activities of archival institutions in South Africa. The security of records and archives could be compromised by the lack of close liaison between archival institutions and fire departments. Some archival institutions did not have automatic fire detection systems. Most archives and records were not protected by alarm systems although all archival institutions employed security personnel round the clock.

Reformatting strategies and conservation treatment were not effectively addressed. Preservation standards and guidelines for the long-term preservation of records and archives were equally not adequately dealt with. Pest management activities were carried out on a regular basis. However, pest control systems seemed to place little emphasis on the health and safety and protection of human beings working with records and archives.

Archives and records were created on largely acidic paper and there was no concern to store them in acid free archival boxes. Incoming air was only filtered at four (57.14%) archival institutions. As a result records and archives had the potential of being contaminated and

damaged by air and gaseous pollutants such as sulphur dioxide, nitrogen oxides, hydrogen peroxide, hydrogen sulphide and ozone that cause harmful chemical reactions that lead to the formation of acid in materials.

Staff and users were trained in the handling of archival materials. There were written guidelines for handling for staff and the public. Users and staff alike could learn to respect the national documentary heritage and handle archival materials with care if they were aware of their obligations. Archival institutions had a regular programme for dusting, cleaning and monitoring of strong rooms and they were reported to be clean. Archival institutions in South Africa designed and implemented filing systems in government offices, appraised records and conducted inspections to make sure that directives were adhered to.

7.2.2 Conclusions about means and processes employed to make information contained in records and archives accessible

NARSA had a directory of archival institutions in South Africa. Therefore, intellectual access to the archival heritage in repositories was available within reasonable limits. Although, appropriate reading room facilities were available to facilitate access to archives and the retrieval of information in them, some records and archives remained inaccessible to the public because they had not been arranged and described. Archives were described according to a standard set by NARSA. However, descriptive inventories were not available for all the archives in archival repositories. The absence of finding aids is one of the indicators that access to some records and archives is limited or not possible. This constitutes a major infringement of the people's right to information that would be otherwise open to the public according to the twenty years closed period. Without finding aids, access to information as envisaged in the Promotion of Access to Information Act 2000 and the National Archives of South Africa Act would remain a pipe dream. The existence of backlogs severely compromises the capacity of the national and provincial archives to make all archival holdings accessible.

7.2.3 Conclusions about the legal situation related to the preservation of, and access to records and archives

Access to public records and archives was no longer as restricted as it was during the time of apartheid. The law guaranteed public access to information. In that regard, the ideals of the PAIA are shared by the National Archives Act, which also sought to promote public access to information and records. Given the high level of illiteracy among South Africans, it remains to be seen whether or not the PAIA and the National Archives of South Africa Act would be able to provide an environment that is conducive to the promotion of access to information contained in public archives and records.

Access to information is not automatically granted by the PAIA but is rather facilitated and made much easier than was the case before the Act. It must be emphasized that the right to access cannot be unlimited. There can be legitimate restrictions on this right. Ensuring appropriate access to records and protecting legitimate confidentiality interests in records both hinge on knowing exactly what records exist and ensuring that they are organised in efficient records systems. To that extent if the provisions of the PAIA are fully implemented they might lead to more efficient records management practices in South Africa.

On the other hand, all records that have been in existence for 20 years are public archives open for public inspection subject to the provisions of any other Act of Parliament. However, some records that were over twenty years remained closed in some repositories due to the sensitive nature of the information they contained. Processes for requesting special access to restricted materials were not sufficiently communicated to users in many archival institutions in South Africa. However, records in the so-called “offices of record” (that is, Department of Home Affairs, Master of the High Court, Registrar of Births, Marriages and Death, Registrar of Deeds and Parliament) fell outside the jurisdiction of the National Archives of South Africa Act of 1996 as amended.

The national and provincial archives have a unique statutory obligation to guide public bodies in records management policies and procedures. There was no comprehensive provincialisation agenda to deal with the preservation of records and archives in South Africa. The inadequacy of the guidance was sadly clear when it came to the management of electronic

records. While the National Archives of South Africa Act of 1996, as amended, provided a broad framework for the provincialisation of the preservation of, and access to records, there was a general lack of requisite resources to carry out the preservation of records and archives at the provincial level. The problem was compounded by lack of expertise in preservation activities.

According to Ketelaar (1990) archival legislation should provide for the safe custody in suitable buildings of all national and provincial archives and the provision of facilities for the repair and conservation of archival material of all kinds by appropriate methods. Archival legislation in South Africa did not explicitly authorise the national and provincial archives to provide for facilities for the repair and conservation of archival material. The National Archives Regulations of 1997 were silent regarding preservation policies and procedures. The manner in which provincial and national archival legislation was developed had adversely affected the ability of archival institutions to promote the preservation of documents.

7.2.4 Conclusion about the impact of information technology on the preservation of, and access to records and archives

Although electronic records are proliferating throughout government, many archival repositories have not yet addressed the implications of the preservation of, and access to digital materials. Policies and other technical guidance addressing best practices in digital preservation were inadequate. In addition to that, NARSA had little expertise in the area of electronic records keeping (Directorate State Archives and Heraldic Services 1999-2000:21).

Although the full impact of the use of information and communications technology applications on access to records and archives in South Africa has not been fully assessed, ICTs seem to hold promise for systematising and facilitating access to information on the nature and whereabouts of both private and public archives and records in South Africa. A significant part of the archival holdings, probably more than half, were not yet incorporated into the NAAIRS database (National Archives of South Africa 2000a). A considerable number of South Africans did not have access to ICTs. The challenge for the archival profession is to make sure that automation does not become a barrier to accessing information contained in records and archives in South Africa as well as ensuring that the automated information

retrieval system becomes inclusive in terms of having information that is of utility to the majority of South Africans.

7.2.5 Conclusions about skills and experience in preservation management

The study established that there was a paucity of personnel skilled in preservation. It is evident from Table 26 that there is an acute shortage of staff and absence of expertise in key areas like microfilming, digitisation, audiovisual materials, environmental and disaster planning and recovery. First and foremost, for people to implement preservation programmes they need knowledge of preservation issues. Knowledge of preservation techniques and procedures is fundamental to implementing preservation activities.

Table 24 shows that only 5.03% of the staff employed in the preservation and conservation of public records and archives in South Africa were trained abroad. It is difficult to escape the conclusion that most of the staff are ill-qualified for preservation activities because institutions offering LIS education in South Africa do not pay much attention to preservation issues. Indeed, Chapman (1986:vii) once remarked that the Achilles heel of the information professional education was preservation.

Although, on-the-job training was a favoured method of acquiring additional skills favoured by 88.89% of the respondents, experts such as Bradsher (1988:14) warned against relying on in house training and advocated formal training. Given that fact, a lot needs to be done in terms of training and educating archivists in South Africa in order to ensure future access to records.

7.2.6 Conclusions about steps that have been undertaken to safeguard records and archives

Research into preservation issues was very limited. Archival institutions had not identified projects for immediate improvement of the situation. For example, immediate restoration campaigns, training workshops and how-to-do-it procedure manuals were not widely part and parcel of managing records and archives. Medium and long-term measures for the permanent safeguarding of records and archives were nonexistent. Awareness and promotion of informed

discussions about the importance of preservation are gradually making inroads into the South African archival landscape.

7.3 CONCLUSIONS ABOUT THE RESEARCH PROBLEM

The aim of this research was to provide basic and practical information needed to enable staff to both plan and implement sound records and archives care programmes and contribute to the development of a national preservation policy. The number of units of analysis used for this investigation was inevitably small, so the conclusions made here are tentative. However, it is important to recognise that the size of the population was compensated for, to some extent by what Babbie and Mouton (2001:270, 272) referred to as “thickness” of the reporting, the thoroughness of the review of relevant issues in the literature and in-depth data that was collected by the survey.

Preservation and access were clearly seen as vital elements of the management of records and archives both in the literature and by the surveyed archival institutions. However, from the analysis of data on preserving records and archives in South Africa, it is very difficult to escape the conclusion that archivists have taken a “piecemeal approach to preservation”, to use the words of Conway (1990:221). Preservation was not a well-established permanent activity. Archivists in South Africa had not made preservation an integral part of their archival management functions. For, instance, public records and archives were not adequately protected against the “ten agents of deterioration”, namely, direct physical force, fire, water, pests, contaminants, radiation, incorrect temperature, incorrect humidity, custodial neglect, and thieves and vandals (Costain 1994; Waller 1995). Technological obsolescence was a major threat to e-records. Archival institutions understood the general problem, but most of them did not know how to address it.

There was a great deal of unrealised potential in the use of public archives and records for administrative, academic and personal activities. Outreach programmes were being actively pursued, however, the strategies used for public programming activities were rather limited and not clearly targeted as a result of lack of user studies at some archival institutions. As a matter of fact, the programmes had not been evaluated for their effectiveness. Electronic access tools had not been effectively used to enhance access to public records and archives.

Electronic access tools would enable much broader access to public records and archives, initially through descriptive inventories and indexes, and eventually through electronic delivery of documents themselves, but they will not necessarily reach those most deprived of access.

Notwithstanding this somewhat gloomy assessment, there are significant initiatives on preserving records and archives and making them available. There is a growing recognition that archives must be protected in the office of creation and that all users of the records are best served by the application of scientific standards to archival work (Duranti 1999; Schellenberg 1971:26). It has now been realized that in order to have “total archives” that preserve “a balanced documentary memory of ... society-of all aspects of ... society-so that future generations have a complete memory”, the issue of preserving records cannot be left until the last stage of the record life cycle (Millar 1998:139). In that regard, archival institutions approved records classification systems, appraised records and carried out records surveys and inspections.

Some archivists in South Africa no longer keep records for the sake of purely preserving them. Archivists are increasingly encouraging the public to use records and archives in their holdings through public programming activities. Indeed, giving access to records has become the major justification for the existence of archives. Staff and users were trained in handling of documentary materials. There were regular cleaning programmes in most archival institutions. On the basis of some of the conclusions made by the study, the recommendations for action and consideration are made below.

7.4 RECOMMENDATIONS

Archival institutions should incorporate preventive and remedial preservation strategies in their practices. Preventive conservation entails correct handling and use, storage and display of materials. Emphasis should be on preventive rather than remedial interventions. Remedial preservation is a very expensive preservation option. The momentum of keeping the storage areas clean should be maintained as a preservation preventive measure. Pre-archival intervention should be stepped up and resources for carrying out inspections and other records management activities should be made available. Media conversion and restoration should be

made the hallmark of archival operations. Policies, practices and standards for the preservation of documentary materials should be prepared and publicized.

To improve the preservation of public records and archives in South Africa the establishment of a national preservation and access committee under the auspices of the National Archives and Records Service of South Africa is proposed. The committee will aim at: a) increasing the awareness and education of archival professionals and the general public through relevant channels, b) the promotion of the implementation of preservation policies, c) promotion of communication and cooperation at local, national and international level, d) addressing national issues such as use of acid-free paper, translation of finding aids into eleven official languages used in South Africa and use of standards and guidelines, e) initiating research projects, and f) promotion of the creation of conservation and microfilming centres. Some of the issues raised in relation to the proposed work of the national preservation and access committee are explicated below.

7.4.1 Recommendations for activities and strategies used in the preservation of records and archives in South Africa

Archival institutions should develop preservation practices that include actions and policies designed to prolong the useful life of information. They should store archival materials in suitable buildings, equipment and environmental conditions. In addition, to having tools of controlling the climate in archival repositories, institutions should have a systematic monitoring programme in order to effectively manage the environment where records and archives are kept. According to Kaplan (2001) a controlled environment can also prevent large scale out-breaks of moulds. In addition to a controlled environment, archival holdings should be inspected regularly for signs of mould.

Steps should be taken to make all institutions aware of the importance of maintaining their HVAC systems on a regular basis. Archival institutions should use dependable tools of monitoring temperature and RH such as hygrothermographs. In addition, they should use the Preservation Calculator described in section 2.8.1 of Chapter Two to determine how temperature and RH affect materials in storage and to obtain on-the-spot evaluation of any given storage conditions. Staff members should understand the institution's desired climate

targets as well as the importance of monitoring (Patkus 1998:74). A systematic monitoring programme holds the most promise to providing conditions favourable to the long-term survival of records and archives. Although, monitoring will not, in itself, solve the difficult problem of climate management, it is the only dependable tool for decision-making.

Archivists should also balance the conflict between preservation and user access by adopting suitable document reformatting strategies. Suitable equipment to access records should be provided. There is need for increased funding, as it is critical to the success of preservation efforts. For preservation programmes to succeed they should have consistent and ongoing institutional support, and the amount of money available for preservation activities should be clearly defined. Archival institutions should incorporate measurement and evaluation in their preservation activities. They should adapt or design a preservation survey instrument to use in assessing their preservation needs. They should also conduct facilities needs analysis and planning. Provincial archives facilities should be built, expanded, or upgraded to ensure the proper preservation of records and archives. Photocopying causes a lot of damage to archival material. Therefore, there should be some photocopying guidelines for researchers and staff alike to avoid damage to archival materials and records.

Archival repositories should consistently maintain agreed preservation standards. Archival institutions should establish links with their national standards setting bodies, which in turn would link them up with international bodies such as ISO and ICA. The standards for archival repositories should be reviewed on a continuous basis. In addition, archival repositories should pursue initiatives such as the Encoded Archival Description and ISAD (G) to unify access to information about holdings across repository boundaries. The Interdivisional Committee for the Improvement of Finding Aids at NARSA should update and upgrade the manual finding aids as well as align the standards of archival description to international ones.

Archival institutions in South Africa should also consider implementing some of the existing standards listed at Appendix 14. For instance, the implementation of standards on storage requirements for library and archive materials (ISO/DIS: 11799) and paper for archival documents (ISO 11108: 1996) are long overdue. Archival institutions should identify and disseminated information about standards of good records care and archival management

practices in all media, and provide additional guidance and training to facilitate their successful implementation throughout the archival infrastructure in South Africa.

National standards for access to records and archives are also necessary. Access lies at the heart of the South African Constitution, the National Archives of South Africa Act of 1996 and the Promotion of Access to Information Act of 2000. Standards would help repositories and government offices to rationalise their roles in providing access to information as well as providing an efficient service. The standards would provide a yardstick against which performance could be measured.

Pest control systems should place special emphasis on health and safety and protection of the environment in which they are used. The welfare of human beings who use the premises where insecticides and pesticides are used is also paramount. Archival institutions should be given a copy of the labels and material safety data sheets for each pesticide used in and around their institutions. The copy of the label would inform the archivists about the appropriateness of the chemical used for the reported problem while the material safety data sheet would advise on what to do if there was an accident during application or if some people complained that the pesticide affected them.

Under the present conditions whereby archival institutions in South Africa have shown little interest in establishing the effectiveness and potential hazards of chemicals used to treat their holdings, it is compelling to recommend that archival institutions should use the ‘least chemical approach’ such as the integrated pest management (IPM) strategy suggested by experts such as Alpert (1994), Chicora Foundation (1994), Gilberg (1994), Parker (1988) and Swartzburg (1995).

Records of enduring value must be produced on acid free permanent paper. Archivists and records managers should recommend that record creators use acid free permanent paper for records of enduring value. The fact that most paper-based documents in the archival institutions in South Africa were not created on acid-free paper means that there is an urgent need for instituting conservation processes such as deacidification, microfilming and digitisation in order to preserve records and archives for present and future generations. Basic

supplies, such as acid-free storage boxes and permanent paper, should be tested in order to ensure that they conform to archival preservation standards (Mazikana 1995:27). NARSA should support regional conservation centres and initiate reprography projects.

Disaster prevention and response plans should be prepared for all archival repositories. The planning process should take place during the calm before a disaster occurs. The plans should be well researched and tailored to fit the specific needs of each repository. The plans should include planned responses to both internal and external disasters and be reviewed with all staff. Electronic security measures such as such as CCTV should be used to enhance security of records and archives. In that light, all repositories that house archival materials should be equipped throughout with a fire detection and alarm system wired directly to the local fire department or to another 24-hour monitor. All detectors and alarms should be regularly tested and maintained according to the manufacturers' specifications. Staff members should work with the local fire department to develop a fire safety programme. Regular fire inspections and drills should be held, and staff should be trained in evacuation procedures.

Archival institutions should develop easy-to-understand guidelines for the management of records and archives in all media. There is need for clear guidelines for managing electronic records so that their preservation will not be left at the mercy of archivists who have limited expertise. Clear policies and guidelines on preserving e-records as well as the means of reading and utilising them should be formulated. Methods for digital preservation such as emulation, refreshing and migration discussed in Chapter Two could be used. Thorough training of the implementers of the policies should complement the written guidelines and policies. A national preservation policy and plan should also be formulated to address some of the recommendations that have been made by the current research. The planning activities outlined at Appendix 15 could be used as a model for formulating preservation policies.

7.4.2 Recommendations for the legal situation related to the preservation of records and archives and making them accessible

According to Schedule 5 of the Constitution of South Africa “archives other than the national archives” are designated a functional area of “exclusive provincial legislative competence”. For the provincialisation of archival services to be effective each province should pass its own

archival legislation. The debates that go with the process of passing legislation in parliament could provide archives an opportunity to be visible and raise awareness of the importance of their preservation among policy makers. In fulfilling their constitutional mandate with respect to the preservation of archives, they will be obliged to provide an infrastructure and a separate budget for the archives and records function.

Archival legislation must be amended in order to ensure that records of the so-called “offices of record” (that is, Department of Home Affairs, Master of the High Court, Registrar of Births, Marriages and Death, Registrar of Deeds and Parliament) fall under the jurisdiction of NARSA. The need to have all public documents in South Africa to be controlled by NARSA was also stressed by the Truth and Reconciliation Commission of South Africa (1998:328) in one of its recommendations. The recommendation was made in light of the difficulties that the TRC experienced in trying to access the archives of the former National Intelligence Agency. It is conceded that a special status for such bodies appropriate to the sensitivity of the records they generate would be legitimate, but that they should remain fully subject to the professional supervision of the NARSA.

According to section 5(11)(c) of the National Archives of South Africa Act, the National Archives is supposed to promote the use of archives by the public. The implications of public programming to preservation efforts are obvious. If the national and provincial archives are successful in their promotion of the use of archives then there might be increased reference to archives resulting in the deterioration of records if they are not handled properly. Records and archives are part of the heritage of any country and concern for making them accessible should not lead to jeopardising their very existence. Therefore, access to records and archives should be promoted and facilitated as envisaged in the legislation, but care and safety of the documentary materials should be of paramount concern.

Archival and freedom of information legislation should effectively address preservation issues. The legislation should address preventative measures that should be taken into consideration when giving access to records so that they do not deteriorate. The provisions related to the preservation should be made as explicit as other archival functions such as transfer and use of public archives. It is also important for PAIA to address the issues

pertaining to the deterioration of records due to handling, and other factors described in section 2.8 of Chapter Two.

7.4.3 Recommendations to address the impact of information technology on the preservation of, and access to records and archives

Perhaps, of all the preservation challenges none is more pressing than developing strategies of dealing with electronic records. According to the Directorate of State Archives and Heraldic Services (1999-2000:11) there is “need for vigorous action if the loss of South Africa’s electronic memory is to be averted”. To that end, a national strategy for digital preservation is needed and that a central body such as NARSA should assume a proactive role in promoting standards and best practices. Professional development opportunities and training should be offered to equip staff with skills for responding to the challenges associated with adopting information technology. Lobbying funding agencies like the National Research Foundation (NRF) to promote research into the preservation of digital objects should be one of the major priorities of archival institutions.

The rapid changes in record keeping technologies and the preservation challenges presented by diverse media require constant upgrading of knowledge and skills among state archives and records management personnel. National and provincial archival institutions should develop human resources capacity in order to deal with the challenges posed by new information and communication technologies. They should also harness the power of technology to improve and broaden access to records and archives.

As record keeping moves from paper to electronic systems, it is essential for archival professionals to formulate policies to ensure that the new media create and maintain records that are comprehensive, authentic, and tamperproof. In addition, records created today should be readable with tomorrow's technology. In essence, archivists in South Africa should take an active role in ensuring that electronic records are protected from technological obsolescence and media impermanence. NARSA should act timeously to implement migration strategies envisaged in its strategic plan (Kirkwood & Venter 1999/2000:36).

7.4.4 Recommendations for means and processes employed to make information contained in records and archives accessible

Archival institutions should promote programmes that stress access and the users' right to information. As Jo Pugh (1992:60) pointed out, access policies should indicate the types of information that may be restricted and how restrictions will be applied, describe the finding aids and reference services, describe how records will be made available including rules for using materials, and establish policies to respond to requests for permission to publish from holdings. In other words, users should be made aware of the restrictions of access to certain documents as well as the means of getting access to them. Archival institutions should improve access by providing adequate finding aids.

7.4.5 Recommendations for skills and experience in preservation management

One of the lessons being learned by archivists and records managers is that laws or regulations requiring good record keeping and archival practices are not enough. To have a real effect on the proper creation and maintenance of records, archivists and records managers must be provided with ongoing guidance and training. It is also important to note that the rapid changes in record keeping technologies and the preservation challenges presented by diverse media require constant upgrading of knowledge and skills among archival professionals.

All archival institutions should appoint personnel solely responsible for preservation activities. Skills and knowledge required for records and archives preservation professionals need to be identified and training needs analysis undertaken. Trained professional with the necessary preservation skills are key to the success of preservation activities. To meet the challenges of preserving and accessing records and archives, South African archivists should continue to develop their skills and knowledge through continuing life long education. Regional, national and local professional organisations, not only in archives but also in the library and information fields, and tertiary institutions can provide avenues for training in preservation techniques.

Since, individuals in different types of repositories prefer many different venues for assistance and training, the institutions that provide educational services must collaborate in developing programmes and coordinate their schedules to maximize availability and minimize

unnecessary duplication. A national conference to bring together educationists from all the organizations and agencies that are involved in archival training and education should be initiated in order to identify skills development needs and set a common agenda. In that regard, the basic preservation skills identified at 10 could be used as a building block.

7.4.6 Recommendations on some steps to safeguard records and archives

Archival institutions should collaborate in order to share costs, and utilise expertise and infrastructure in their preservation efforts. Research into the development of preservation processes and equipment should be initiated. The research initiatives should bear in mind that Porck and Teygeler (2000) pointed out that funding for research tends to favour large-scale activities that are intended to prevent damage to the original than research primarily aimed at individual items or small parts of the holdings.

Archival institutions should determine the barriers of access to preservation information. They should also determine the appropriate means for delivering preservation information. Sessions on preservation should be included in staff induction and training programmes. Archival institutions should identify projects for immediate improvement of the situation (for example, immediate restoration campaigns, training workshops and how-to-do-it procedure manuals). They should investigate the medium and long-term measures for the permanent safeguarding of records and archives. They should raise awareness and promote informed discussion about the importance of preservation. They should also design model preservation plans.

Over and above exhibitions, news releases in the print and electronic media, brochures and other publications, clip packs (written press pieces about the institution), fact sheets, schedules of forthcoming events, photographs of key items from the collection and business cards are some of the means that the archivists in South Africa could use to make sure that records of enduring value are known and used by the public.

7.5 IMPLICATIONS FOR THEORY

The implications of a study for theory largely depend on the extent that the results have external validity and generalizability. Confirmability which is generally associated with qualitative studies also comes into play. Confirmability refers to the extent to which the results

of a study are supported by evidence rather than the personal bias of the researcher (Babbie & Mouton 2001: 278). Meltzoff (1998:282) defined external validity as: “The degree to which the results of a research study can be generalized to persons, places, settings, or procedures beyond the study”. External validity depends on the intent and claims of the study (Meltzoff 1998:45). For Campbell and Stanley (1963) external validity and generalizability were synonymous. Mook (1983) distinguished between them:

To what populations, setting, and so on, do we want the effects to be generalized? Do we want to generalize at all... The question of external validity is not the same as the question of generalizability (Mook 1983: 379).

It is evident from the statement of the problem in section 1.2 of Chapter One that the purpose of the research was to describe how things are in the real world and to determine relationships that might exist. The intention was to generalize the results to South Africa and other African countries. According to Meltzoff (1998:48) the key to generalizability is whether or not the study can be reproduced. Replication makes claims to generality more credible. According to Meltzoff (1998:46) some aspects of generality are:

- Would the same results be obtained with a different researcher, data collector?
- Would the same results be obtained if the study were conducted in a different environment, place, or setting?
- Can the results be generalized to other geographical locations?
- Would one get the same answer to the research problem under different conditions and with different procedures and apparatus or with different methods of measurement?

Another researcher carrying out a repeat study on the subject of the current research may get the same results under different conditions and using different procedures and apparatus if the research is conducted in the immediate future in the same context. The results could be generalized to other countries in Africa that have the same approach to the management of archives as South Africa.

7.6 IMPLICATIONS FOR POLICY AND PRACTICE

The findings of this study may go a long way in influencing policy and practice. If the recommendations of the present study are taken into consideration they could help in the formulation of preservation policies for records and archives in South Africa. The study might

give public archival institutions the strategic direction they require to initiate any preservation measures for the protection of public records and archives. The study will, in turn, assist archival institutions to understand the physical needs of records and to meet, or extend, nationally and internationally agreed standards for the preservation of archival materials.

Knowledge generated by research forms an important component in the decision-making process. It is evident that there is very little researched-based information in South Africa on preserving records and archives and making them accessible. It is tempting to argue that policy-makers are making decisions that are not backed by the necessary research information. Thus, suggestions given in the study are likely to inform the decision-making process and the allocation of funds for preservation activities.

Training and education of the archival professionals in South Africa could be influenced by the results of the present study. The need to lay emphasis on training in preservation activities such as microfilming, digitisation, audiovisual materials and disaster management is important both to policy makers and educators in South Africa as highlighted by the present study.

7.7 FURTHER RESEARCH

The assessment of preservation strategies and activities and making public records and archives available for present and future generations is the first such inquiry and study of this magnitude in South Africa. It has, consequently, brought to the fore several issues that require further research that would provide in depth understanding of the issues critical to the preservation of public records and archives as well as making them accessible. Furthermore, the limitations of the current study that were identified in section 4.4 of Chapter Four mean that more research should be done.

Current research seems to suggest that storage conditions for film should be colder and drier than was previously believed, but there is no agreement as to the exact ranges for temperature (Wilkie 1999:26). That should be an area of interest to archival and records professionals. Assessing problems of preservation using quasi-experimental and experimental methods such as testing the pH of records and archives in South Africa's archival repositories would also be

useful. The test for the presence of lignin in records and archives also falls under experimental methods. Lignin is an undesirable element introduced to paper in the papermaking process.

As was demonstrated in section 2.8.4.2 of Chapter Two there is no reliable information on the growth of moulds in an archival environment as most of the information available on the growth and development of mould was derived from laboratory cultures rather than on site studies. There is need for research in an archival environment to determine the actual conditions that promote the growth and development of these organisms. According to Joshi (1995:73) very little research has been done to determine what pollution levels actually cause the deterioration of archival materials. As it was mentioned in section 2.8.3, the research into pollution levels that could cause serious damage to archival materials was beyond the scope of the present study.

A repeat study on the preservation of electronic records and audiovisual materials should be necessary. At the moment there is very little reliable information on the management of digital objects and audiovisual materials partly because archival institutions lack expertise in those areas and partly due to the fact that preservation efforts are still biased towards paper-based records and archives. The current study did not gather enough data on how archival institutions are providing for the preservation and use of audiovisual formats. A repeat study could also be done to assess the impact of some of the policies that are being formulated to address the problem of preserving records and archives in some of the archival repositories that were surveyed.

Public and non-public records and archives characterize the South African archival landscape. A study to assess preservation efforts of non-public records would give an understanding of the extent that the collective memory of the South African society is at risk of being inaccessible. The study would also provide baseline data that can be used as a basis of comparing preservation activities in the public and private sectors. Comparative studies on preserving and making public records and archives accessible are also necessary at both international and regional level. Support for such studies may be sought from ESARBICA at a regional level and IFLA and ICA on the international plane.

Research into the effectiveness of archival pest management programmes and the feasibility of using the ‘least chemical approach’ such as the integrated pest management approach would be worthwhile. Assessing the handling and care for records in the creating government departments should be an interesting undertaking.

According to Snell (1993) the improvement of governmental record management is often cited as one of the benefits of FOI legislation. However, very little evidence is available to support that fact in South Africa. There is need for empirical research to establish both the negative and positive effects of FOI on the management of records and archives in South Africa.

7.8 IN CONCLUSION

The study achieved its purpose of providing basic and practical information needed to enable staff in provincial and national archives of South Africa to both plan and implement sound records and archives care programmes and contribute to the development of national preservation policy. Recommendations based on the study’s findings have been made both for action in South Africa and for further research.

Accessible government records and archives are essential tools of democracy. Citizens depend on public records and archives to maintain documentation about many key facts about their lives as well as the conduct of their government. Records and archives also deepen the citizens’ understanding of their institutions and history. Continued access to public records largely depends on how they are preserved. However, preservation management remains a neglected area in the preservation of public records and archives not only in South Africa but worldwide as well. Yet, preservation is key to making records and archives accessible for present and future generations. If undertaken methodically and comprehensively, preservation has the potential to support access to information contained in records and archives and improving the quality of archival holdings throughout their life span.

In summary the study’s conclusions are that South African archival repositories should allocate more resources to preservation activities, store archival materials under suitable conditions, comply with agreed standards of preservation and access, use the “least chemical method” when dealing with infestations, provide means of access that minimize the risk of

damage, reformat heavily used materials and those in a poor condition, undertake conservation treatment, prepare disaster plans, formulate preservation and access policies, formulate adequate preservation strategies, research and disseminate information on preservation activities, train and develop staff in preservation techniques, collaborate with other heritage institutions in preservation related matters, raise awareness of the importance of preservation and carry out user studies to promote the use of information contained in records and archives. Given adequate and appropriate resources and facilities, archival institutions in South Africa can effectively preserve information contained in public records and archives and make it available for the present and future.

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³⁹ Web addresses were valid as of 10 October, 2003.

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APPENDICES

Appendix 1: List of postal and street addresses of public records and archives repositories in South Africa

A. NATIONAL ARCHIVES AND RECORDS SERVICE OF SOUTH AFRICA

A1. NATIONAL ARCHIVES REPOSITORY

1. The Head

Postal address: Private Bag X236, Pretoria, 0001

Street address: 24 Hamilton Street, Arcadia, Pretoria

Telephone: (012) 323 5300. Fax: (012) 323 5287.

Email: arg10@dacst4.pwv.gov.za

A2. NATIONAL FILM, VIDEO AND SOUND ARCHIVES

2. The Head

Postal address: Private Bag X236, Pretoria, 0001

Street address: 698 Church Street East, Arcadia, Pretoria

Telephone: (012) 343 9767. Fax: (012) 344 5143.

Email: film01@hotmail.com

B. PROVINCIAL ARCHIVES SERVICES

B1. EASTERN CAPE PROVINCIAL ARCHIVES SERVICE

3. Head Office

The Provincial Archivist

Postal address: Private Bag X7468, King Williams Town, 5600

Street address: 5 Eales Street, King Williams Town

B1.1. Port Elizabeth Archives Repository

4. The Head

Postal address: Private Bag X3932, Port Elizabeth, 6056

Street address: 1 De Villiers Street, Port Elizabeth

Telephone: (041) 484 6451. Fax: (041) 484 6451

B1.2. Umtata Archives Repository

5. The Head

Postal address: Private Bag X5095, Umtata, 5100

Street address: c/o Owen Street and Alexander Road, Umtata

B2. FREE STATE ARCHIVES PROVINCIAL ARCHIVES SERVICE

6. The Head

Postal address: Private Bag X20504, Bloemfontein, 9300

Street address: 29 Badenhorst Street, Bloemfontein

Telephone: (051) 522 6762. Fax: (051) 522 6765.

Email: fsarch01@hotmail.com

B3. KWAZULU-NATAL PROVINCIAL ARCHIVES SERVICE

7. The Provincial Archivist

Postal address: Private Bag X75, Ulundi, 3838

Street address: Block 4, Unit A, Ulundi

Telephone: (035) 879 8500. Fax: (035) 879 8518.

B3.1. Durban Archives Repository

8. The Head

Postal address: Private Bag X22, Greyville, 4023

Street address: Nashua House, 14 De Mazonod Street, Greyville

Telephone: (031) 309 5682. Fax: (031) 309 5685.

Email: darch01@hotmail.com

B3.2. Pietermaritzburg Archives Repository

9. The Head

Postal address: Private Bag X9012, Pietermaritzburg, 3200

Street address: 231 Pietermaritz Street, Pietermaritzburg

Telephone: (033) 342 4712. Fax: (033) 394 4353.

Email: pmbarch01@hotmail.com

B4. LIMPOPO PROVINCIAL ARCHIVES SERVICE

10. The Head

Postal address: Department of Sport, Arts and Culture, Archives Service, Private Bag X9668, Giyani, 0826

Street address: Department of Education, Government Buildings, Main Road. Giyani

Telephone: (015) 812 1911 or 082 680 2201. Fax: (015) 812 1623.

B5. MPUMALANGA PROVINCIAL ARCHIVES SERVICE

11. The Head

Postal address: PO Box 1243, Nelspruit, 1200

Telephone: (013) 766 5062. Fax: (013) 766 5594.

B6. NORTHERN CAPE PROVINCIAL ARCHIVES SERVICE

12. The Head

Postal address: Private Bag X5004, Kimberley, 9300

Street address: 6th Floor Dutoitspan Building, Dutoitspan Road, Kimberley 8301

Telephone: (053) 831 1761. Fax: (053) 833 4353.

Email: aluxton@ds.ncape.gov.za

B7. NORTH WEST PROVINCIAL ARCHIVES SERVICE

13. The Head

Postal address: Private Bag X6, Mmabatho, 2735

Telephone: (018) 387 0213. Fax: (018) 392 1087.

B8. WESTERN CAPE PROVINCIAL ARCHIVES SERVICE

14. The Head

Postal address: Private Bag X9025, Cape Town, 8000

Street address: 72 Roeland Street, Cape Town

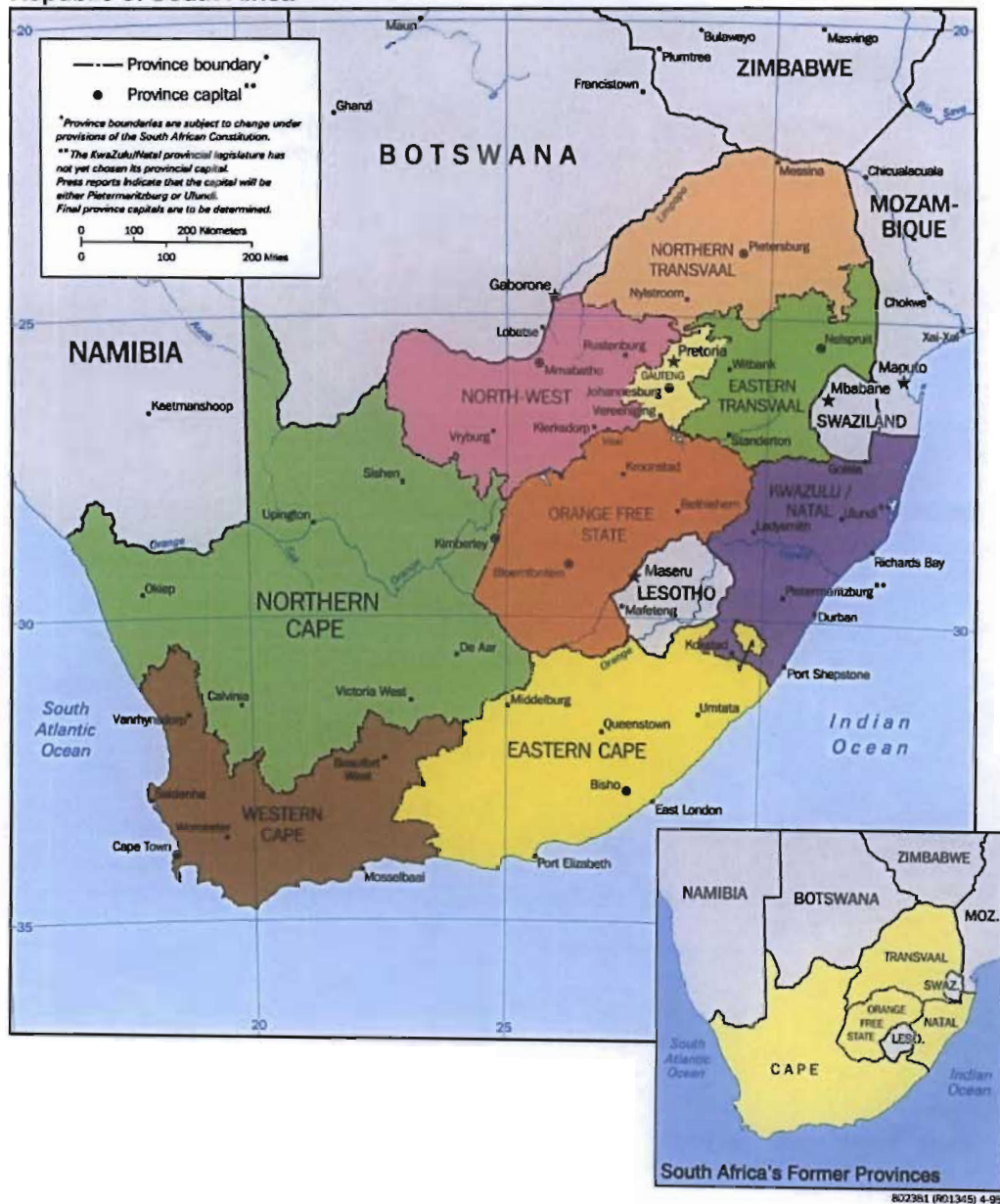
Telephone: (021) 462 4050. Fax: (021) 45 2960.

Email: capearch01@hotmail.com

Appendix 2: Map showing the nine provinces of South Africa

(Source: <http://www.gov.za/>)⁴⁰

Republic of South Africa



⁴⁰ The current name for the Northern Transvaal is Limpopo Province and Eastern Transvaal is called Mpumalanga Province.

Appendix 3: Covering letter for pretesting the questionnaires

Dear colleague

I am a student at the University of Natal doing a PhD in Information Studies. I am seeking your assistance in my research project. The main aim of the project is to assess the current preservation and access strategies for public records and archives in South Africa. In order to ensure the validity and reliability of the questionnaire as a data collection tool, I am conducting a pretest on the questionnaire I am intending to use for the study. The target population are the national and provincial archives. Your comments and contributions will be most welcome. Over and above you comments and observations can you also, please scrutinize the questionnaire using the checklist that is provided below.

(i) Are there any typographical errors? Yes No

(ii) If your answer is “Yes”, please indicate them in the questionnaire.

(iii) Are there any misspelt words? Yes No

(iv) If your answer is “Yes”, please indicate them in the questionnaire.

(v) Do the item numbers make sense? Yes No

(vi) If your answer is “No”, please, provide some suggestions below:

.....
.....

(vii) Is the type size big enough to be easily read? Yes No

(viii) If your answer is “No”, please, provide some suggestions below:

.....
.....

(ix) Is the vocabulary appropriate for the respondents? Yes No

(x) If your answer is “No”, please, provide some suggestions below:

.....
.....

(xi) Is the survey too long? Yes No

(xii) If your answer is “Yes”, please, provide some suggestions below:

.....
.....

(xiii) Is the style of the items too monotonous? Yes No

(xiv) Are the skip patterns too difficult to follow? Yes No

(xv) If your answer is "No", please, provide some suggestions below:

.....
.....

(xvi) Does the survey format flow well? Yes No

(xvii) If your answer is "No", please, provide some suggestions below:

.....
.....

(xviii) Are the items appropriate for the respondents? Yes No

(xix) If your answer is "No", please, provide some suggestions below:

.....
.....

Please return the completed questionnaire to me at the University of Natal, School of Human and Social Studies, Private Bag X01, Scottsville, 3209, Pietermaritzburg, South Africa. Telephone: 033 2605972. Fax 033 2605092. E-mail ngulubep@nu.ac.za by 30 July 2002.

Thanks in advance for your time in taking part in the pretest of my questionnaire.

Yours faithfully

Patrick Ngulube

Appendix 4: Covering letter for the survey instrument for collecting information on preservation of, and access to public records and archives in South Africa

Dear colleague

I am a student at the University of Natal doing a PhD in Information Studies. I am seeking your assistance in my research project. The main aim of the project is to assess the current preservation strategies for public records and archives in South Africa and to seek effective models for developing preservation activities. The survey is designed to gather data about preservation policies and means, storage and handling of archival materials, access to records and archives, education and training for preservation and formats and condition of the media on which records and archives are recorded.

All replies will be treated in the strictest confidence. Data will be presented only in the aggregate; responses will not be attributed to particular respondents, organizations, or departments. I realise that there are many other demands on your time, but believe me, the results will be beneficial to all those with responsibility for preserving important records and archival collections in South Africa. I intend to share the results of the study with all archival institutions mandated to preserve public records and archives in South Africa. Drawing on current good practice, the project will be of direct practical benefit to archivists and records managers, while long-term developments may have important implications for future planning and funding. Results of the survey may also be used to develop training programmes; mechanisms for resource sharing and services that meet preservation needs for archives and records in South Africa.

I am sending the enclosed questionnaire to all public archival institutions in South Africa. I should be grateful if you would complete and return it by 30 October 2002. Should you have any queries about the study, please do not hesitate to contact me at the University of Natal, School of Human and Social Studies, Private Bag X01, Scottsville, 3209, Pietermaritzburg, South Africa. Telephone: 033 2605972. Fax 033 2605092. E-mail ngulubep@nu.ac.za

Thank you for your time and cooperation.

Yours faithfully

Patrick Ngulube

Appendix 5: Survey instrument for collecting information on the preservation of, and access to public records and archives in South Africa

Case Number

Instructions for filling in the questionnaire

- a) Tick the applicable answer(s).
- b) Use spaces provided to write your answers to the questions. Please print.
- c) Please, do not leave blank spaces. If the question does not apply please indicate "N/A".
- d) If you use additional sheets of paper for detailed answers, please, indicate in all cases the question number you are referring to.
- e) There are different interpretations of the terminology used in archivology. Where applicable, please, refer to the given definitions when responding to the survey to increase consistency of the results.

STRATEGIES AND ACTIVITIES FOR PRESERVING RECORDS AND ARCHIVES

Part A: Institutional data and holdings

- 1. Name of institution
- 2. Address
- 3. Telephone
- 4. Fax
- 5. E-mail address
- 6. Website
- 7. Volume of holdings (in linear meters):
- 8. Type of records Percentage of the total holdings
 - a) Paper
 - b) Photographs
 - c) Magnetic tapes
 - d) Electronic records (other than those created by you)

- e) Microforms (microfilm, microfiche, etc)
- f) Video tapes
- g) Computer media (tapes diskette, CD-ROM)
- h) Cinematographic films
- i) Phonographic records
- j) Other, please specify

9. What dates are encompassed by your records and archives? (Please give earliest and latest dates for bulk of collection)

10. Did your institution inherit any archival records from central government and/or former homeland? Yes No

Part B: Preservation policies and means
--

11. Do you have a mission statement? Yes No, go to question 15

12. If you answer to question 11 is "Yes", please state your mission statement

.....

.....

13. Is there a document containing your mission statement?
 Yes (attach a copy if possible) No

14. If your answer to question 16 is "Yes", please state the name of the document

.....

15. Do you have a policy to:
- a) Improve preservation conditions Yes No
 - b) Develop conservation facilities Yes No
 - c) Train and recruit qualified personnel Yes No
 - d) Microfilming records Yes No
 - e) Transfer records into other media (digitisation) Yes No

16. Do you have a written preservation policy? Yes, go to # 19 No

17. If "No", do you intend to formulate one within the next 12 months?

- a) Yes
- b) No
- c) Do not know
- d) Other, please specify

18. If you do not have a written preservation policy, do you have an existing preservation strategy? Yes No

19. Into which of the following categories does your institution's annual budget fall? (include salaries, building maintenance, utilities, etc., devoted to the management, storage, and use of the records)

- a) R10,000 – R49,000
- b) R50,000 – R99,000
- c) R100,000 - R249,000
- d) R250,000 – R499,000
- e) R500,000-R999,000
- f) More than R1,000,000

e) If your annual budget is more than R 1,000, 000, please supply the figures

20. Is there a specific vote for preservation activities? Yes No

21. If "No", please give a brief explanation

22. What is your current annual expenditure on preservation and conservation?

- a) 1%-4% of annual budget
- b) 5% -9% of annual budget
- c) 10% -19% of annual budget
- d) Other, please specify

23. Over the past five years, the financial allocations to preservation and conservation of holdings has:

- a) Remain unchanged
- b) Increased
- c) Decreased
- d) Do not know

24. Do you have in-house conservation facilities? Yes No

25. Do you have a conservation workshop operating in your institution? Yes No

26. Which of the following preservation options do you use? (Please tick all the applicable options).

- a) Boxing
- b) Microfilming
- c) Digitisation

- d) Encapsulation
- e) Lamination
- f) De-acidification
- g) Leaf casting
- h) Other, please specify

27. Is there a micro-photographic or reprographic unit operating in your institution?

Yes No

28. Is the personnel carrying out preservation activities trained in preservation techniques?

Yes No

29. Is your institution involved in co-operative preservation activities with any of the following institutions in South Africa?

- a) Libraries Yes No
- b) Art galleries Yes No
- c) Museums Yes No
- d) Research laboratories Yes No
- e) Other, please specify

30. Do you co-operate in the preservation field with any

- a) National institutions Yes No
- b) Regional institutions Yes No
- c) International bodies Yes No

31. Give brief details if your answer to any of the given options in question 30 was "Yes".

.....

.....

.....

32. Overall, how successful do you consider your current preservation policy/strategy to be in achieving your institution's preservation goals?

- a) Very successful
- b) Moderately successful
- c) Of limited success
- d) Unsuccessful
- e) No opinion

33. What factors influenced your answer to the previous question? (Please tick all the applicable options).

- a) Funding
- b) Commitment
- c) Key personnel (staff)
- d) Other, please specify

34. Please elaborate on your answers to questions 32 and 33.

.....
.....
.....

Part C: Standards

35. Does your archives adhere to:

- a) storage standards? Yes No
- b) preservation standards Yes No
- c) access standards Yes No

36. If your answer to question 35 is “Yes”, please list the standards you adhere to under the three categories given below:

- a) National
- b) Regional
- c) International

37. Are members of staff familiar with these standards? Yes No

38. Are they applied consistently? Yes No

39. How often are they reviewed?

- a) Once in 5 years
- b) Once in 10 years
- c) Once in 20 years
- d) Do not know
- e) Never
- f) Other, please specify

40. Does your institution have any influence over the formulation of national standards pertaining to the preservation of archival materials? Yes No

41. If, “Yes”, please elaborate

42. Has the National Archives of South Africa established any standards for your institution?
[] Yes [] No, go to question 44

43. If your answer to question 41 is “Yes”, which of the following standards were set by the National Archives of South Africa? (Please tick all the applicable options).

- a) Standards for managing electronic records Yes [] No []
- b) Standards for microfilming Yes [] No []
- c) Standards for archival repositories Yes [] No []
- d) Standards for paper used to capture archival documents Yes [] No []
- e) Standards for handling of records Yes [] No []
- f) Standards for photocopying Yes [] No []
- g) Standards for ink for archival records Yes [] No []
- h) Standards for describing archives Yes [] No []
- i) Other, please specify

44. Has your institution established standards for the preservation of records in the hands of the creating departments? [] Yes [] No go to #46

45. If your answer to question 44 is “Yes”, please give details of the standards

.....

.....

Part D: The building for the storage of archival materials

46. Type of building:

- a) Was the building constructed for the purpose of its current use? Yes [] No []
- b) Was it adapted to use? Yes [] No []
- c) When was it built?
- d) What materials are used in the structure of the building? [] Brick [] Concrete
[] Other, please, specify
- e) From what material is the floor in the stack areas made from?
.....
- f) Has the building ever been renovated? Yes [] No []
- g) If your answer to item (f) is “Yes”, please state the year the building was last renovated
- h) How long has your institution occupied the building?

- i) Is your institution the only tenant in the building? Yes No
- j) Is the building subject to regular technical maintenance? Yes No
- k) Are the stack areas isolated from the other parts of the building Yes No
47. Proximity to the environments that pose preservation problems
- a) Is the building located in the industrial area? Yes No
- b) Is the building located in an area with considerable air pollution? Yes No
- c) Is the building located close to the sea? Yes No
- d) Is the building located close to a river? Yes No
- e) Is the building located close to a dam? Yes No
- f) Is the building located close to a possible military target? Yes No
- g) Other, please specify
48. Is the building equipped with? (Please tick all the applicable options).
- a) De-humidifiers Yes No
- b) Humidifiers Yes No
- c) Air filtering Yes No
- d) Windows with filtering glass Yes No
- e) Air conditioning Yes No
49. Are there water pipes close to the stacks (records storage area)? Yes No

Part E: Temperature and relative humidity

50. Does your building have a heating, ventilation and air conditioning (HVAC) system?
 Yes No, please, skip to question 55.
51. If you have one, how old is the HVAC system?
- a) More than 10 years
- b) 4 to 10 years
- c) 1 to 3 years
- d) Less than 1 year
52. How often is the HVAC system maintained?
- a) Annually
- b) Twice a year
- c) Once in two years
- d) Never

- e) Other, please specify
53. Is the HVAC system on at all times? Yes No
54. Does the HVAC system provide constant climate control throughout the year?
Yes No
55. If you do not have a HVAC system, please state how the following conditions are achieved
- a) heating
- b) ventilation
- c) cooling
56. Is incoming air filtered Yes No
57. Does the place housing archives have separate environmental controls systems from
- a) Offices? Yes No
- b) Reading rooms? Yes No
58. What is the average temperature in the:
- a) Building? Do not know
- b) Repository? Do not know
- c) Outside the building? Do not know
59. Do you monitor temperature levels in your repositories constantly? Yes No
60. Does your institution have controlled temperatures of between 13°C and 21°C in areas where records and archives are stored? Yes No
61. Do you monitor relative humidity (RH) levels in your repositories constantly?
Yes No
62. Does your institution have controlled RH of between 35% and 60% in areas where records and archives are stored? Yes No
63. Does your archival institution use environmental monitoring devices? Yes No go to question 68
64. Are the monitoring units functioning? Yes No
65. When were they last calibrated? State the year
66. Which of the following instruments do you use for measuring relative humidity at your institution? (Please tick all the applicable options).
- a) Dataloggers
- b) Hygrothermograph

- c) Psychrometers
- d) Humidity indicator strips
- e) Hygrometer
- f) Thermometer

67. Of the devices that are mentioned in question 66 which of them do you use for measuring temperature?

Part F: Light

68. What are the sources of light in areas where archives are stored?

69. For how many hours are records exposed to light during the day?

70. Are lights in the repository turned off when not in use? Yes No

71. Do you control light from the windows in your storage areas? Yes No

72. Do you control artificial lighting in your storage areas? Yes No

73. Do you take light level readings? Yes No

74. If the answer to question 73 is "Yes", please state how often the levels are taken

Part G: Pest management

75. Do you check all materials that are to be accessioned before they enter the archives?
Yes No

76. Have you ever experienced any insect invasion or vermin infestation in the building?
Yes No

77. Do you carry out routine extermination of vermin infestation (insects, rodents, etc.)?
Yes No

78. If "Yes", please tick the answer that applies to the frequency that the extermination is done:

- a) Once a year
- b) Twice a year
- c) Once in two years
- d) Rarely

79. What method do you use?

80. Who does it?

81. If done by a contracted Company (Please supply name of Company)
82. State the chemicals used?
83. Do you see evidence of pests in spite of these treatments? Yes No
84. Do you receive a written statement of the findings and work after each treatment cycle?
Yes No
85. Do you receive a copy of label and a material safety data sheet for each pesticide used in
and around your institution? Yes No

Part H: Storage and handling

86. Is the storage area generally clean? Yes No
87. How often is the records storage area cleaned?
88. How often are the files examined?
89. Do you carry out annual stocktaking of your archival holdings? Yes No
90. Do you test storage furniture before use? Yes No
91. If "Yes", please state the substance that you use for testing
92. Do you test archival storage boxes before using them for storing archival records?
Yes No
93. If so, what do you use for testing?
94. Is smoking permitted in the records office? Yes No
95. Is there a "no smoking sign" prominently displayed in the office? Yes No
96. Is eating permitted in the records office? Yes No
97. Is there a "no eating sign" prominently displayed in the office? Yes No
98. The records are stored in: (Tick the appropriate storage equipment used in your repository).
- | | |
|--------------------------------------|--------------------------|
| a) Adjustable shelving | <input type="checkbox"/> |
| b) Non adjustable shelving | <input type="checkbox"/> |
| c) Sliding racks | <input type="checkbox"/> |
| d) Stationary racks | <input type="checkbox"/> |
| e) Wooden filing cabinets or drawers | <input type="checkbox"/> |
| f) Steel filing cabinets or drawers | <input type="checkbox"/> |
| g) Acid free archival boxes | <input type="checkbox"/> |
| h) Box files | <input type="checkbox"/> |
| i) Flat files | <input type="checkbox"/> |

99. Do you have adequate space for shelving and storage? Yes No
100. Who has access to the storage place?
- a) Staff only
- b) Staff and the users
101. Are users trained in the handling of records? Yes No
102. Are staff trained in the handling of records? Yes No
103. Are there written guidelines for handling for staff? Yes No
104. Are there written guidelines for handling for the public? Yes No
105. Do you duplicate or photo-reproduce materials for widespread distribution? Yes No
106. Is photocopying done by staff or users?
107. Who determines what can be safely copied?

Part I: Disaster preparedness and management

108. Is there a written disaster preparedness and recovery plan for your institution? Yes No

No, go to #114

109. If "Yes", please choose the aspects that it covers from the list below.

- a) It deals with safe evacuation of people
- b) It deals with records
- c) It deals with the building
- d) It describes emergency procedures
- e) It outlines disaster response
- f) It lists emergency supplies
- g) Other, please specify

110. Choose from the list the natural disasters covered by your plan

- a) Floods
- b) Earthquakes
- c) Tornado
- d) Mould
- e) Insects
- f) Other, please specify

111. Choose from the list the human-made disasters covered by your plan

- a) Fire

- b) Bomb threats
- c) Vandalism
- d) Other, please specify

112. When was your disaster preparedness and recovery plan last tested?

- a) This year
- b) Last year
- c) Within the last two years
- d) Never
- e) Other, please specify

113. When was your disaster preparedness and recovery plan last reviewed?

114. Is there a disaster planning team in place? Yes No

115. Is there a chain of command to deal with a disaster? Yes No

116. Is there a duplicate shelflist/inventory/register? Yes No

117. If your answer is "Yes" to question 116, where is it kept?

118. Have staff been instructed in emergency planning? Yes No

119. If "Yes", please explain.

120. Have staff been instructed in emergency recovery procedures? Yes No

121. If "Yes", please explain.

122. How far from the floor are records stored?

123. How far from water bearing pipes are the storage areas?

124. Does your institution share salvage and recovery supplies with other cultural heritage institutions (i.e. having communal disaster supplies) Yes No

125. If "Yes", please list the organisations that you share with

126. Do you carry out simulated disaster drills? Yes No

127. Do you have alternative sources of electric power like a generator? Yes No

Part J: Fire detection and suppression

128. Does your records storage area have a fire detection system? Yes No

129. What type of fire detection system is in place?

130. Is it connected to a central monitoring facility? Yes No, go to #132
131. If "Yes", please give the name and location
132. Does your institution have regular visits by the local fire department?
 Yes No, go to #134
133. If "Yes", please choose the purpose(s) of visit from the list below.
- a) Inspections
 - b) Program on fire prevention
 - c) Staff training
 - d) Other, please specify
134. Has the fire department been made aware of what records are to be saved? Yes No
135. Has the fire department been made aware of the special procedures for dealing with special collections or formats? Yes No
136. Are fire extinguishers available throughout the repository and the building in general?
 Yes No, go to #140
137. If "Yes", please state the numbers in:
- a) The repository
 - b) The building
138. State type of fire extinguishers used
- a) Halon
 - b) Multipurpose
 - c) Electrical
 - d) Water
 - e) Carbon Dioxide
139. How often are the extinguishers inspected?
140. Has staff been trained to use fire extinguishers? Yes No, go to #142
141. If "Yes", please specify who did the training?
142. Is there a sprinkler system or any other type of fire suppression system in the building?
 Yes No, go to #147
143. If "Yes", please, choose the type you have from the list provided below.
- a) Wet pipe
 - b) Dry pipe with delay mechanisms
 - c) Other, please, specify
144. Has it ever been tested? Yes No

145. If "Yes", please state when it was last tested

146. Who did the testing?

Part K: Security

147. What security systems exist? (Please tick all the applicable options).

- a) Employ security personnel
- b) Electronic security system
- c) Closed circuit television cameras (CCTV)
- d) Intruder alarm system

148. If you have an intruder alarm system is it linked to the police or a third party such as a security firm? Yes No

149. If "Yes", please state its name and location

150. What is the response policy?

151. How often is the system tested?

152. Are there security personnel around the clock? Yes No

153. Are there burglar/intrusion alarms? Yes No

154. Where are they located?

155. How many access points are there to the building?

156. Who has the keys to the building?

157. Does the place where records are stored have windows? Yes No

158. Are the windows barred? Yes No

Part L: Records in general

159. Within the past two years have you carried out a holdings survey of the majority of your archives to identify potential preservation problems? Yes No

160. Have you observed any damages caused by: (Please tick all the applicable options).

- a) Water damage
- b) Mould
- c) Insects
- d) Fire
- e) Light
- f) Poor handling

- g) Inadequate storage
- h) Vandalism
- i) Acidity (brittle)
- j) Other, please specify

161. What is the overall condition of the archival holdings?

- Very good Good Average Unsatisfactory

162. Which classes of records are in particularly poor condition?

163. In the table below state your views about the general physical condition of the records and archives in your holdings.

Attribute	Strongly agree	Agree	Strongly disagree	Disagree	Undecided
They are dirty (soiled, stained)					
Deteriorating through wear and tear					
Condition of paper is poor (acidic and brittle)					
Condition of photographs is bad					
The condition of audiovisual materials (films and tapes, etc.) is poor					
The condition of electronic records is poor					
Condition of records generally poor because of mould attack					

164. Have you observed deterioration resulting from the use of documents by the public?

Yes No

165. If "Yes", do you ascribe the deterioration to: (Please tick all the applicable options).

- a) Frequent use
- b) Inadequate supervision
- c) Photocopying
- d) Microfilming
- e) Scanning
- f) Other, please specify

166. Who carries out conservation treatment?

- a) Done in-house
- b) Done commercially
- c) Done at the national archives (Pretoria)
- d) Not done

167. During the past year, have you undertaken any of the following preservation/conservation measures, either in-house or through an outside contractor? (Please tick all the applicable options).

- a) Microfilming or other imaging (optical disk transfer)
- b) Document conservation/repair
- c) Disaster recovery
- d) Upgraded environmental controls
- e) Other, please specify:

168. Is space available or allocated for future or expanding archival holdings? Yes No

INFORMATION TECHNOLOGY AND THE PRESERVATION OF RECORDS AND ARCHIVES

The term “**digital materials**” refers to information sources in digital form, including converted materials and electronic records. The definition encompasses materials originally in digital form and never exists in print or analog form (also called “born-digital” and “electronic records”) as well as digital surrogates of analog materials created for access and preservation purposes through the use of imaging and recording technologies. **Migration** refers to periodic transfer of digital materials from one hardware/software configuration to another, or from one generation of computer technology to a subsequent generation. **Refreshing** refers to copying digital files in their original digital format from old to new media. **Preservation** refers to long-term storage, maintenance and migration of digital materials.

Part M: Digital materials policy

169. Does your institution currently have any written policies for managing digital materials?

Yes No, go to # 173

170. If “Yes”, where are copies of these available?

- a) Website (give website details)
- b) Publication (give title, publisher)
- c) Other, please describe

171. If “Yes”, does policy provide guidelines for: (Please tick all the applicable options).

- a) acquiring materials in digital form

- b) converting materials from print to digital form
- c) storage
- d) refreshing
- e) migration

172. If “Yes”, how well does this policy meet your institution’s current needs?

- Perfectly Satisfactorily Inadequately

173. Has your archival institution any agreed standards or guidelines for the long-term preservation of electronically created records? Yes No, go to 175

174. If “Yes”, where are copies of these available?

- a) Website (give website details)
- b) Publication (give title, publisher)
- c) Other, please describe

Part N: Current holdings

175. Does your institution have any digital materials in its holdings for which it assumes responsibility for their preservation? Yes No

176. Does your institution accept or acquire electronic records for which it assumes preservation responsibility? Yes No, go to #178

177. If “Yes”, do you accept electronic records in any format, or only in specified formats?

- Any
- Specified only, please indicate

178. Does your institution currently create digital materials as a result of digital conversion projects or by any other conversion methods? Yes No

Part O: Storage methods and formats

If you do not currently have electronic records in your holdings, please, skip to question 195.

179. Does your archival institution have any dedicated hardware or software systems for the long-term preservation of electronically created records? Yes No, go to #181

180. If “Yes”, what format(s) do these use?

.....

181. Which of the following formats are present in the digital holdings for which your institution assumes preservation responsibility? (Please tick all the applicable options).

- Flat ASCII files
- Text files with markup (e.g., SGML, HTML, XML, etc)
- Wordprocessing format (e.g., MS Word, etc)
- Database format (e.g., Access, FoxPro, etc)
- Spreadsheet format (e.g., Excel, etc)
- Image format (e.g., TIFF, GIF, etc.)
- Audio
- Video / Moving Images
- Other, please specify

182. What method(s) do you use to store electronic records, that is, those materials received in digital form? (Please tick all the applicable options).

- Store as received
- Transfer to other digital storage medium - please indicate:
- Hard drive
- Magnetic tape (open reel)
- Magnetic tape (cassette or cartridge)
- CD-ROM
- Optical Disc (Rewritable)
- WORM Optical Disk (Write-once-read-many)
- Contract with third party for storage
- Other method, please specify:

183. In what year were the oldest digital materials in your holdings written to their current storage medium? Do not know

184. What is their current storage medium and format?

185. Are there any digital materials in your holdings for which you lack the operational and/or technical capacity to mount, read, and access? No Yes

186. If "Yes", please give brief details

187. Does your institution have an established method for preserving digital materials?

No Yes

188. Does your institution refresh digital materials? No Yes

189. If "Yes", please describe frequency/method:

190. Does your institution migrate digital materials? No Yes

191. If "Yes", please describe frequency/method:

192. Can your institution determine or estimate the quantity of digital materials for which you currently have preservation responsibility? No Yes

193. If "Yes", please provide the following details:

..... approximate number of unique files

..... total storage volume (in MB, GB, etc.)

194. How would you rank the following factors as threats to the loss of digital materials at your institution within the next 5 years? 1 = greatest threat, 2=moderate threat, 3 = smallest threat, 4=no threat, 5=undecided

a) Physical condition

b) Technological obsolescence

c) Insufficient policy or plan for preservation

d) Insufficient resources for preservation

e) Other, please, specify

195. Does your institution plan to increase the level of staff expertise with digital preservation? Yes No go to question 197

196. If you answer to question 195 is "Yes", what methods does your institution plan to use over the next 3 years to increase the level of staff expertise with digital preservation? (Please tick all the applicable options).

a) Local courses in computer or digital technology

b) Training provided by professional organizations

c) Training provided by vendors

d) Independent study/assessment

e) Hire staff with digital knowledge or experience

f) Other, please specify:

197. What is the highest level of knowledge available in-house for digital preservation activities?

Expert Intermediate Beginner Novice None

LEVEL OF SKILLS AND KNOWLEDGE IN PRESERVATION MANAGEMENT

198. In the table below indicate some of the features of the staff employed in the preservation and conservation of public records and archives at your institution? Technical training = technician without university degree; academic = university degree plus professional qualification in conservation. Do not leave blank spaces. Indicate "NA" where it does not apply.

Variable	Total
Number of staff at your institution	
Staff directly involved in preservation and conservation activities	
Number trained abroad	
Number trained in South Africa	
Number with technical training	
Number with academic training	
Number with the highest qualification as Std 10	
Number with the highest qualification as Std 12	
Number with the highest qualification as a Certificate in archives or records	
Number with the highest qualification as a Diploma in archives or records	
Number with the highest qualification as a bachelor's degree without archives studies	
Number with the highest qualification as a bachelor's plus archival diploma or certificate	
Number with the highest qualification as a Masters in an archival related discipline	
Number with the highest qualification as a PhD in an archival related discipline	
Other highest qualification, please specify them below the table	
Number with training in deacidification	
Number with training in microfilming	
Number with training in digital preservation	
Number with training in developing conservation-restoration programmes or surveys	
Number with training in providing advice and technical assistance for conservation-restoration of cultural property	
Number with training in developing and implementing preventive and handling procedures	
Number with training in evaluating conservation problems in context	
Other, please specify	

199. Do you conduct any in-service training in preservation and conservation? Yes [] No []

200. If your answer is “Yes”, please provide a brief description of the training that is provided

.....

201 In the table below rank your institution’s amount of expertise in dealing with the following: (0- none; 1- basic; 2- in-house training, reading, some workshops; 3- in-depth workshops and advanced training; 4- conservation experience and have undergone graduate program)

Area of expertise	0	1	2	3	4
Audio materials					
Electronic records					
Disaster planning and recovery					
Holdings maintenance					
Environmental monitoring					
Preservation planning					
Microfilm					
Photographs					
Paper-based materials					

202. In what areas and at what levels does your staff have the greatest need for additional training? (Please circle all the applicable options).

	Basic	Intermediate	Advanced
a) Archival methods	a	b	c
b) Uses of computers in archives	a	b	c
c) Appraisal, collection development	a	b	c
d) Electronic records	a	b	c
e) Records management	a	b	c
f) Preservation/conservation methods	a	b	c
g) Disaster preparedness	a	b	c
h) Public relations/outreach	a	b	c
i) Other, please specify			

203. What would be the best method(s) for providing additional training to your staff? (Please tick all the applicable options).

- a) Graduate course(s) in archival administration
- b) Institutes on archival methods/techniques (1-2 weeks)
- c) Workshop(s) on archival techniques (1-2 days)

- d) Internships
- e) On-the-job training
- f) Archival consultant services
- g) Publications, printed training manuals
- h) Other, please specify:

204. For which of the following do you feel your institution needs additional training? (Please tick all the applicable options).

- a) Audio materials
- b) Electronic records
- c) Microfilming
- d) Environmental monitoring
- e) Holdings maintenance
- f) Disaster planning and recovery
- g) Preservation planning
- h) Other, please, specify

205. Does your institution conduct research relating to conservation and restoration?

Yes No

206. If your answer is "Yes", please, provide brief details

207. Does your institution disseminate information gained from examination, treatment or research on the preservation of records and archives? Yes No

208. If your answer is "Yes", please provide brief details

209. Do you use microfilm for preservation purposes? Yes No go to question 216

210. If "Yes", how much material do you film per annum?

211. Do you have in-house microfilming facilities? Yes No

212. If "Yes", how many cameras do you have?

213. If "Yes", in what formats? 16mm 35mm

Other, please specify

214. How many staff do you employ for microfilming?

215. What criteria do you use for selecting documents for microfilming?

.....
216. If your answer to question 209 is "No" did you ever do so? Yes No

217. If you have used microfilming in the past, why did you stop?

ACCESS TO INFORMATION CONTAINED IN RECORDS AND ARCHIVES

218. Are all your records and archives open to use at present? Yes No

219. If your answer is "No", please explain why access is limited

.....
220. Are users made aware of their access rights and their responsibility to comply with the policies and regulations of your archival institution? Yes No

221. Are users' interests and needs analysed at regular intervals, and policies and practices adjusted accordingly? Yes No

222. Through which of the following are users able to locate descriptions of your records and archives? (Please tick all the applicable options).

a) Card catalogue

b) Word processed registers/inventories

c) Printed guide to whole collection

d) Computer catalogue accessible in-house

e) Computer catalogue accessible remotely

(via dial-up modem connection, Telnet, Internet, etc.)

f) World Wide Web site, please provide URL:

g) Other, please, specify:

223. What portion of your records and archives are described in one or more of the finding aids listed in 222, above?

a) Less than 25%

b) 25-49%

c) 50-74%

d) 75-100%

224. Are any of the following significant impediments to the use of your records and archives? (Please tick all the applicable options).

a) Cannot physically locate them

- b) Lack of indexes or other finding aids (because records have not been processed)
- c) Necessary equipment not available (microfilm readers, tape players)
- e) Records have deteriorated beyond use
- f) Processing backlog
- g) Other, please specify

225. Is there a designated reading room provided for consulting archival materials onsite?
 Yes No

226. Estimate the average number of research requests received last year in the following categories:

- a) Regular mail letters
- b) Electronic mail requests
- c) In person daily visits
- d) By telephone calls
- e) No research requests received

227. What equipment does your organization have at its disposal for use in managing or making your records and archives available? (Please tick all the applicable options).

- a) Photocopier(s)
- b) Microfilm reader(s) or reader-printer(s)
- c) Microfilm camera(s)
- d) Copying equipment for photographs
- e) Tape/video players
- f) Computers
- g) Other, please specify

228. Is there sufficient physical and technical equipment to facilitate easy and safe access to all types of records held? Yes No

229. If your answer is "No", please give details of the deficiency

.....

.....

230. Are staff providing access fully trained for their jobs? Yes No

231. Are access facilities adequate for the physically challenged (disabled) Yes No

232. Are there established standards governing the quality of service provided by your institution? Yes No

233. Are users aware of their obligation to comply with copyright legislation and access conditions when using information contained in records and archives? Yes No
234. If your answer is “Yes”, please describe the mechanisms used to make them aware.
.....
235. Are citation guidelines and processes for permission to publish information from records and archives communicated to users? Yes No
236. If “Yes”, please give brief details
.....
237. Are reprographic processes like microfilming and photocopying controlled to minimize damage to records? Yes No
238. Are reprographic processes like microfilming and photocopying not undertaken where they endanger the records? Yes No
239. Are reading room rules and handling guidelines clearly communicated to the users?
Yes No, go to # 241
240. If your answer to question 240 is “Yes”, how are they communicated?
- a) In writing
- b) Verbally
241. When are the guidelines communicated to the users?
- a) Briefly during use
- b) Briefly before use
- c) Workshops/ classes
- d) Other, please specify
242. Do researchers consult records under constant supervision by staff? Yes No
243. Are processes for requesting special access to restricted records communicated to users? Yes No
244. Are you using the Internet for giving information about your archives and its contents in a strategic way (that means: with the goal to guide users)? Yes No, go to question 246.
245. If “Yes”, please state the kind of information you offer? (Please tick all the applicable options).
- a) General information about your archives (for instance, “technical” information like addresses and opening hours)
- b) Information about access and use conditions (laws and regulations)

- c) General historical information
- d) Information about fonds and records
- e) Access to descriptive databases
- f) Access to electronic and digital records
- g) Links to other archives
- h) Other, please specify

246. Does your description method or description of archives match any generalized standards?
 Yes No, go to #248

247. If "Yes", please state the archival standards of description that your institution uses.

.....

248. Which of the following strategies do you use in your public programming activities
(Please tick all the applicable options).

- a) Brochures
- b) Exhibitions
- c) Electronic media
- d) Print media
- e) Fliers
- f) Public lectures
- g) Workshops and seminars
- h) Publications
- j) Newsletter
- k) Other, please specify

249. Do you have a written public programming plan? Yes No

250. Please rank each of the following priorities for improving the management of your archives and records and making them available for use: (Please circle one for each: 4=major priority; 3=moderate; 2=minor; 1=not a priority; 0=undecided)

	Major	▶	▶▶	▶▶▶	None
Increase funding	4	3	2	1	0
Increase capacity of storage space	4	3	2	1	0
Improve storage conditions (temperature & humidity controls, security)	4	3	2	1	0
Improve staff training or expertise	4	3	2	1	0
Encourage greater use of collections	4	3	2	1	0
Improve finding aids	4	3	2	1	0
Automate description systems	4	3	2	1	0
Reformat collections (microfilm, imaging)	4	3	2	1	0
Develop policies/procedures for handling new media	4	3	2	1	0

Preservation/conservation of collections	4 3 2 1 0
Develop disaster plan	4 3 2 1 0
Process backlog of acquired collections	4 3 2 1 0
Introduce/improve records management in government agencies	4 3 2 1 0
Increase commitment of parent organization	4 3 2 1 0
Increase visibility of or public support for archive and records programmes	4 3 2 1 0

LEGAL SITUATION RELATED TO THE PRESERVATION OF RECORDS AND ARCHIVES

251. Does your institution have its own archives act? Yes (attach copy if possible) No go to question 253.

252. Is "Yes", does it spelt out issues relating to the preservation and access to your archives and records? Yes No

253. If not, what act to you use to fulfil your mandate of preserving and making your records and archives available? (Attach copy of the Act if possible)

254. Do you think that your institution has a role in the effective implementation of the Promotion of Access to Information Act, 2000? Yes No

255. Please, briefly explain your answer to question 254

256. Have you experienced difficulties in seeking to promote access in terms of the Act? Yes No

257. Please, briefly explain your answer to question 256

258. Please use the space below for any additional comments or concerns related to the management, care, or use of your organization's records and archives

.....

259. I am available to be contacted for further information to advance the purpose of this study and sharing the results thereof Yes No

Name: Title

Phone E-mail

Thank you very much for your time.
 Please return the completed questionnaire to Mr Patrick Ngulube, University of Natal, School of Human and Social Studies, Private Bag X01, Scottsville, 3209, Pietermaritzburg, South Africa. Telephone: 033 2605972. Fax 033 2605092. E-mail ngulubep@nu.ac.za by 30 October 2002.

Please include copies of the following, if available
 Brochures describing your organization and/or its collections
 Preservation and other policy documents related to the preservation of your holdings
 Please note, a self-addressed return envelope has been enclosed for your convenience

Appendix 6: Covering letter for the survey instrument for collecting information on the preservation of, and access to audiovisual records and archives in South Africa

Dear colleague

I am a student at the University of Natal doing a PhD in Information Studies. I am seeking your assistance in my research project. The main aim of the project is to assess the current preservation strategies for film, video and sound records and archives in South Africa and to seek effective models for developing preservation activities. The survey is designed to gather data about preservation policies and means, storage and handling of materials, access to holdings, education and training for preservation, and formats and condition of the media on which film, video and sound records and archives are recorded.

Your reply will be treated in the strictest confidence. Data will be presented only in the aggregate; responses will not be attributed to particular respondents, organizations, or departments. I realise that there are many other demands on your time, but believe me, the results will be beneficial to all those with responsibility for preserving important records and archival collections in South Africa. I intend to share the results of the study with all archival institutions mandated to preserve public records and archives in South Africa. Drawing on current good practice, the project will be of direct practical benefit to archivists and records managers, while long-term developments may have important implications for future planning and funding. Results of the survey may also be used to develop training programmes; mechanisms for resource sharing and services that meet preservation needs for archives and records in South Africa.

I should be grateful if you would complete and return the questionnaire by 30 October 2002. Should you have any queries about the study, please do not hesitate to contact me at the University of Natal, School of Human and Social Studies, Private Bag X01, Scottsville, 3209, Pietermaritzburg, South Africa. Telephone: 033 2605972. Fax 033 2605092. E-mail ngulubep@nu.ac.za

Thank you for your time and cooperation.

Yours faithfully

Patrick Ngulube

Appendix 7: Survey instrument for collecting information on the preservation of audiovisual records and archives in South Africa

Instructions for filling in the questionnaire

- a) Tick the applicable answer(s).
- b) Use spaces provided to write your answers to the questions. Please print.
- c) Please, do not leave blank spaces. If the question does not apply please indicate "N/A".
- d) If you use additional sheets of paper for detailed answers, please, indicate in all cases the question number you are referring to.
- e) There are different interpretations of the terminology used in archivology. Where applicable, please, refer to the given definitions when responding to the survey to increase consistency of the results.

STRATEGIES AND ACTIVITIES FOR PRESERVING AUDIOVISUAL FORMATS

Part A: Institutional data and holdings

1. Name of institution
2. Address
-
3. Telephone
4. Fax
5. E-mail address
6. Website
7. Type of records in the holdings Percentage of the total holdings
 - a) Photographs
 - b) Magnetic tapes
 - c) Electronic records (other than those created by you)
 - d) Microforms (microfilm, microfiche, etc)
 - e) Video tapes
 - f) Audio tapes
 - h) Cinematographic films
 - i) Gramophone records
 - j) Other, please specify
8. What dates are encompassed by your audiovisual records and archives? (Please give earliest and latest dates for bulk of collection)
9. Do public archival institutions deposit tape and audio recordings from their oral history projects with your institution? Yes [] No []
10. If your answer to question 10 is "No", what arrangements do you rely on to make sure that your institution obtains a copy of the recordings?
-
-

Part B: Preservation policies and means

11. Do you have a mission statement? Yes No, go to #15
12. If you answer to question 11 is "Yes", please state your mission statement
-
-
13. Is there a document containing your mission statement? Yes(attach a copy if possible) No
14. If your answer to question 13 is "Yes", please state the name of the document
-
15. Do you have a policy to:
- | | |
|---|--|
| a) Improve preservation conditions | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| b) Copy nitrate films to acetate | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| c) Train and recruit qualified personnel | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| d) Transfer records into other media (and digitisation) | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| e) Create backup copies | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| f) Transcribe tapes affected by the vinegar syndrome | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| g) Copy videotapes to black and white motion picture film | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| h) Copy analog video to digital video | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| i) Migrate and refresh records | Yes <input type="checkbox"/> No <input type="checkbox"/> |
16. Do you have a written preservation policy? Yes, go to #18 No
17. If you do not have a written preservation policy, do you have an existing preservation strategy? Yes No
18. What is your current annual budget?
19. Is a specific vote for preservation activities? Yes No
20. If "No", please give a brief explanation
-
21. What is your current annual expenditure on preservation and conservation? (Please tick all the applicable options).
- | | |
|--|--|
| a) 1%-4% of annual budget <input type="checkbox"/> | b) 5% -10% of annual budget <input type="checkbox"/> |
| c) 11%-20% of annual budget <input type="checkbox"/> | d) Other, please specify |
22. Over the past five years, financial means allocated to preservation and conservation of holdings has:
- | | |
|---------------------|-----|
| a) Remain unchanged | [] |
| b) Increased | [] |
| c) Decreased | [] |
23. Is you institution involved in co-operative preservation activities with any of the following institutions in your country?
- | | |
|--------------------------------|--|
| a) Libraries | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| b) Art galleries | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| c) Museums | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| d) Research laboratories | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| e) Other, please specify | |
24. Do you co-operate in the preservation field with any
- | | |
|--------------------------|--|
| a) Regional institutions | Yes <input type="checkbox"/> No <input type="checkbox"/> |
| b) International bodies | Yes <input type="checkbox"/> No <input type="checkbox"/> |

25. Give brief details if you answered in the affirmative to any of the given options in question 24.

26. Overall, how successful do you consider your current preservation policy/strategy to be in achieving your institution's preservation goals?

- a) Very successful
- b) Moderately successful
- c) Of limited successful
- d) Unsuccessful

27. What factors influenced your answer to the previous question? Please tick all the applicable options.

- a) Funding
- b) Commitment
- c) Key personnel (staff)
- d) Other, please specify

28. Please comment on your answers to questions 26 and 27.

29. Do you have a conservation workshop operating in your institution? Yes No

30. What preservation options do you use in the conservation and restoration of your holdings?

Part C: Standards

31. Does your institution adhere to any storage, preservation and access standards?

Yes No, go to #36

32. If your answer to question 31 is "Yes", please list the standards you adhere to under the three categories given below:

- a) National
- b) Regional
- c) International

33. Are members of staff familiar with these standards? Yes No

34. Are they applied consistently? Yes No

35. How often are they reviewed?

- a) Once in 5 years
- b) Once in 10 years
- c) Once in 20 years
- d) Never
- f) Other, please specify

36. Does your institution have any influence over the formulation of national standards pertaining to the preservation of audiovisual materials? Yes No

37. Has the National Archives of South Africa established any standards for your institution?

[] Yes [] No, go to # 39

38. If your answer to question 37 is "Yes", which of the following standards were set by the National Archives of South Africa? (Please tick all the applicable options).

- a) Standards for managing digital materials Yes [] No []
- b) Standards for copying nitrate films to acetate Yes [] No []
- c) Standards for archive building Yes [] No []
- d) Standards for copying analog video to digital video Yes [] No []
- e) Standards for handling materials by staff Yes [] No []
- f) Standards for cataloguing audiovisual materials Yes [] No []
- g) Standards for accessing audiovisual materials by the public Yes [] No []
- h) Other, please specify

39. Has your institution established standards for the preservation of audiovisual materials in the hands of the creating agencies? [] Yes [] No go to #41

40. If your answer to question 39 is "Yes", please give details of the standards

.....

.....

.....

Part D: The building for the storage of archival materials

41. Type of building:

- a) Was the building constructed for the purpose of its current use? Yes [] No []
- b) Was it adapted to use? Yes [] No []
- c) When was it built?
- d) What materials are used in the structure of the building? [] Brick [] Concrete [] Other, please, specify
- e) From what material is the floor in the stack areas made from?
- f) Has the building ever been renovated? Yes [] No []
- g) If your answer to item (f) is "Yes", please state the year the building was last renovated
- h) How long has your institution occupied the building?
- i) Is your institution the only tenant in the building? Yes [] No []
- j) Is the building subject to regular technical maintenance? Yes [] No []
- k) Are the stack areas isolated from the other parts of the building Yes [] No []

42. Proximity to the environments that pose preservation problems

- a) Is the building located in the industrial area? Yes [] No []
- b) Is the building located in an area with considerable air pollution? Yes [] No []
- c) Is the building located close to the sea? Yes [] No []
- d) Is the building located close to a river? Yes [] No []
- e) Is the building close to a dam? Yes [] No []
- f) Is the building located close to possible military target? Yes [] No []
- g) Other, please specify

43. Is the building equipped with? (Please tick all the applicable options).

- a) Central air conditioning Yes [] No []
- b) Individual air conditioning per room Yes [] No []
- c) Heating Yes [] No []
- d) De-humidifiers Yes [] No []

- e) Humidifiers Yes No
 - f) Sprinklers Yes No
 - g) Windowless walls Yes No
 - h) Air filtering Yes No
 - i) Thermic isolation Yes No
 - j) Windows with filtering glass Yes No
 - k) Fire detection system Yes No
 - l) Fire extinction system Yes No
44. Are there any water pipes close to the stacks (records storage area)? Yes No

Part E: Temperature and relative humidity

45. Does your building have a heating, ventilation and air conditioning (HVAC) system?
Yes No [] No, please, skip to question 50.
46. If you have one, how old is the HVAC system?
- a) More than 10 years []
 - b) 4 to 10 5 years []
 - c) More than 3 years []
 - d) 1 to 3 years []
 - e) Less than a year, specify []
47. How often is the system maintained?
- a) Annually []
 - b) Twice a year []
 - c) Once in two years []
 - d) Once in ten years []
 - e) Never []
 - f) Other, please specify
48. Is the system on at all times? Yes No
49. Does the system provide constant climate control throughout the year? Yes No
50. If you do not have a HVAC system, please state how the following conditions are achieved
- a) heating
 - b) ventilation
 - c) cooling
51. Is incoming air filtered Yes No
52. Does the place housing archives have separate environmental controls systems?
Yes No
53. What is the average temperature in the:
- a) Building? Do not know
 - b) Repository? Do not know
 - c) Outside the building? Do not know
54. Do you monitor temperature levels in your repositories constantly? Yes No
55. Does your institution have controlled temperatures of between -4°C and 21°C in areas where audiovisual records and archives are stored? Yes No
56. Do you monitor relative humidity (RH) levels in your repositories constantly?
Yes No
57. Does your institution have controlled RH of between 20% and 50% in areas where audiovisual formats are stored?
Yes No

58. Does your organisation use environmental monitoring devices? Yes No go to question 63
59. Are the monitoring units functioning? Yes No
60. When were they last calibrated? State the year
61. Which of the following instruments do you use for measuring temperature and relative humidity at your institution? (Please tick all the applicable options).
- a) Dataloggers
 - b) Hygrothermograph
 - c) Psychrometers
 - d) Humidity indicator strips
 - e) Hygrometer
 - f) Thermometer
62. Of the devices that are mentioned in question 61 which of them do you use for measuring temperature?

Part F: Light

63. What are the sources of light in areas where audiovisual materials are stored?
64. How long are audiovisual materials generally exposed to light during the day?
65. Are lights in the repository turned off when not in use? Yes No
66. Do you control light from the windows in your storage areas? Yes No
67. Do you control artificial lighting in your storage areas? Yes No
68. Do you take light level readings? Yes No
69. If the answer to question 68 is "Yes", please state how often the levels are taken

Part G: Pest management

70. Do you check all materials that are to be accessioned before they enter the archive? Yes No
71. Have you ever experienced any insect invasion or vermin infestation in the building? Yes No
72. Do you carry out routine extermination of vermin infestation (insects, rodents, etc.)? Yes No
73. If "Yes", please tick the answer that applies to the frequency that it is done.
- a) Once a year
 - b) Twice a year
 - c) Once in two years
 - d) Rarely
74. What method do you use?
75. Who does it?
76. If done by a contracted Company (Please supply name of Company)
77. State the chemicals used?
78. Do you see evidence of pests in spite of these treatments? Yes No
79. Do you receive a written statement of the findings and work after each treatment cycle? Yes No

80. Do you receive a copy of label and a material safety data sheet for each pesticide used in and around your institution? Yes No

Part H: Storage and handling

81. Is the storage area generally clean? Yes No
82. How often is the storage area cleaned?
83. How often are the audiovisual materials inspected or examined?
84. How often to you inspect nitrate films?
85. When you inspect films what would you be spot-checking for? (Tick all the applicable options).
- a) Stickiness and other indications of decay
 - b) The stability of the splicing
 - c) Discoloration of black-and-white films
 - d) Colour balance in colour films
 - e) Scratches and perforations
 - f) Shrinkage and growth of fungi
 - g) Other, please specify
-
86. Do you clean films while inspecting them? Yes No
87. Do you maintain a record of the inspection results? Yes No
88. Where is the technical data entered?
89. Do you store separately each type of film-based material? Yes No
90. The films are stored in: (Tick the appropriate storage equipment used in your repository).
- a) Adjustable shelving
 - b) Non adjustable shelving
 - c) Sliding racks
 - d) Stationary racks
 - e) Wooden filing cabinets or drawers
 - f) Steel filing cabinets or drawers
 - g) Acid free archival boxes
 - h) Film cans
91. Do you have adequate space for shelving and storage? Yes No
92. Where are storage areas in relation to other parts of the building?
-
93. Who has access to the storage place?
94. Do you train users in the handling of audiovisual materials? Yes No
95. Are there written guidelines for handling for staff? Yes No
96. Are there written guidelines for handling for the public? Yes No
97. Do you copy materials for widespread distribution? Yes No

Part I: Disaster preparedness and management

98. Is there a written disaster preparedness and recovery plan for your institution? Yes No go to #104
99. If "Yes", please choose the aspects that it covers from the list below
- a) It deals with safe evacuation of people
 - b) It deals with audiovisual materials

- c) It deals with the building
 - d) It describes emergency procedures
 - e) It outlines disaster response
 - f) It lists emergency supplies
 - g) Other, please specify
100. Choose from the list the natural disasters covered by your plan
- a) Floods
 - b) Earthquakes
 - c) Tornado
 - d) Mould
 - e) Insects
 - f) Other, please specify
101. Choose from the list the human-made disasters covered by your plan
- a) Fire
 - b) Bomb threats
 - c) Vandalism
 - d) Other, please specify
102. When was your disaster preparedness and recovery plan last tested?
- a) This year
 - b) Last year
 - c) Within the last two years
 - d) Never
 - e) Other, please specify
103. When was your disaster preparedness and recovery plan last reviewed?
104. Is there a disaster planning team in place? Yes No
105. Is there a chain of command to deal with a disaster? Yes No
106. Is there a duplicate shelflist/inventory/register? Yes No
107. If "Yes" where is it kept?
108. Have staff been instructed in emergency planning? Yes No
109. If "Yes", please explain
-
-
110. Have staff been instructed in emergency recovery procedures? Yes No
111. If "Yes", please explain
-
-
112. How far from the floor are audiovisual materials stored?
113. How far from water bearing pipes are the storage areas?
114. Does you institution share salvage and recovery supplies with other cultural heritage institutions (i.e. having communal disaster supplies) Yes No .
115. If "Yes" please, list the organisations that you share supplies with
-
-
116. Do you carry out simulated disaster drills? Yes No
117. Do you have alternative sources of electric power like a generator? Yes No

Part J: Fire detection and suppression

118. Does your records storage area have a fire detection system? Yes No
119. What type of fire detection system is in place?
120. Is it connected to a central monitoring facility? Yes No, go to #122
121. If "Yes", please give the name and location
122. Does your institution have regular visits by the local fire department?
 Yes No, go to #124
123. If "Yes", please choose the purpose(s) of visit from the list below.
- a) Inspections
 - b) Programme on fire prevention
 - c) Staff training
 - d) Other, please specify
124. Has the fire department been made aware of what records are to be saved? Yes No
125. Has the fire department been made aware of the special procedures for special collections or formats? Yes No
126. Are fire extinguishers available throughout the repository and the building in general?
 Yes No, go to #130
127. If "Yes", please state the numbers in:
- a) The repository
 - b) The building
128. State type of fire extinguishers used
- a) Halon
 - b) Multipurpose
 - c) Electrical
 - d) Water
 - e) Carbon Dioxide
129. How often are the extinguishers inspected?
130. Has staff been trained to use fire extinguishers? Yes No, go to #132
131. If "Yes", please specify who did the training?
132. Is there a sprinkler system or any other type of fire suppression system in the building?
 Yes No, go to #137
133. If "Yes", please, choose the type you have from the list provided below.
- a) Wet pipe
 - b) Dry pipe with delay mechanisms
 - c) Other, please, specify
134. Has it ever been tested? Yes No
135. If "Yes", please state when it was last tested
136. Who did the testing?

Part K: Security

137. What security systems exist? (Please tick all the applicable options).
- a) Employ security personnel
 - b) Electronic security system
 - c) Closed circuit television cameras (CCTV)
 - d) Intruder alarm system
138. If you have an intruder alarm system is it linked to the police or a third party such as a security firm?

- d) Other, please specify
156. Who carries out conservation treatment?
- a) Done in-house
- b) Done commercially
- c) Not done
157. Is space available or allocated for future or expanding archival holdings? Yes No

**INFORMATION TECHNOLOGY AND THE PRESERVATION OF
AUDIOVISUAL FORMATS RECORDS AND ARCHIVES**

Part M: Management of digital materials

158. Does your institution currently have any written policies for managing digital materials?
 Yes No, go to # 160
159. If "Yes", where are copies of these available?
- a) Website (give website details)
- b) Publication (give title, publisher)
- c) Other, please describe
160. If "Yes", does policy provide guidelines for: (Please tick all the applicable options).
- a) acquiring materials in digital form
- b) converting materials from analog to digital form
- c) storage
- d) refreshing
- e) migration
161. If "Yes", how well does this policy meet your institution's current needs?
 Perfectly Satisfactorily Inadequately
162. Does your archive have any dedicated hardware or software systems for the long-term preservation of digital formats? Yes No, go to #164
163. If "Yes", what format(s) do these use?
164. What method(s) do you use to store materials received in digital form? (Please tick all the applicable options).
- Store as received
- Transfer to other digital storage medium - please indicate:
- Hard drive
- Magnetic tape (open reel)
- Magnetic tape (cassette or cartridge)
- CD-ROM
- Optical Disc (Rewritable)
- WORM Optical Disk (Write-once-read-many)
- Contract with third party for storage
- Other method, please specify:
165. In what year were the oldest digital materials in your holdings written to their current storage medium?
166. Are there any digital materials in your holdings for which you lack the operational and/or technical capacity to mount, read, and access? No Yes

167. If “Yes”, please give brief details

168. Does your institution migrate digital materials? No Yes

169. If “Yes”, please describe frequency/method:

170. How would you rank the following factors as threats to the loss of digital materials at your institution within the next 5 years? 1 = greatest threat, 2=moderate threat, 3 = smallest threat, 4=no threat, 5=undecided

- Physical condition
- Technological obsolescence
- Insufficient policy or plan for preservation
- Insufficient resources for preservation
- Other, please, specify

171. Does your institution plan to increase the level of staff expertise with digital preservation? Yes No go to question 173

172. If you answer to question 170 is “Yes”, what methods does your institution plan to use over the next 3 years to increase the level of staff expertise with digital preservation? (Please tick all the applicable options).

- Local courses in computer or digital technology
- Training provided by professional organizations
- Training provided by vendors
- Independent study/assessment
- Hire staff with digital knowledge or experience
- Other, please specify:

173. What is the highest level of knowledge available in-house for digital preservation activities?

- Expert Intermediate Beginner Novice
- None

LEVEL OF SKILLS AND KNOWLEDGE IN PRESERVATION MANAGEMENT

174. In the table below rank your institution’s amount of expertise in dealing with the following: (0- none; 1- basic; 2- in-house training, reading, some workshops; 3- in-depth workshops and advanced training; 4- conservation experience and have undergone graduate programme)

Area of expertise	0	1	2	3	4
Audio materials					
Digital materials					
Disaster planning and recovery					
Holdings maintenance					
Environmental monitoring					
Preservation planning					
Reformatting					
Photographs					

175. In the table below indicate some of the features of the staff employed in the preservation and conservation of public records and archives at you institution? Technical training

=technician without university degree. academic=university degree plus professional qualification in conservation. Do not leave blank spaces. Indicate "NA" where it does not apply.

Variable	Total
Number of staff at your institution	
Staff directly involved in preservation and conservation activities	
Number trained abroad	
Number trained in South Africa	
Number with technical training	
Number with academic training	
Number with the highest qualification as Std 10	
Number with the highest qualification as Std 12	
Number with the highest qualification as a Certificate in archives or records	
Number with the highest qualification as a Diploma in archives or records	
Number with the highest qualification as a bachelor's degree without archives studies	
Number with the highest qualification as a bachelor's plus archival diploma or certificate	
Number with the highest qualification as a Masters in an archival related discipline	
Number with the highest qualification as a PhD in an archival related discipline	
Other highest qualification, please specify them below the table	
Number with training in preservation audiovisual materials	
Number with training in digital preservation	
Number with training in developing conservation-restoration programmes or surveys	
Number with training in developing and implementing preventive and handling procedures	
Number with training in evaluating conservation problems in context	
Other, please specify	

176. Do you conduct any in-service training in preservation and conservation? Yes No

177. If your answer is "Yes", please provide a brief description of the training that is provided

.....

.....

178. What would be the best method(s) for providing additional training to your staff? (Please tick all the applicable options).

- a) Graduate course(s) in archival administration
- b) Institutes on archival methods/techniques (1-2 weeks)
- c) Workshop(s) on archival techniques (1-2 days)
- d) Internships
- e) On-the-job training
- f) Audiovisual consultant services
- g) Publications, printed training manuals
- h) Other, please specify:

179. For which of the following do you feel your institution needs additional training? (Please tick all the applicable options).

- a) Audio materials
- b) Digital materials
- c) Reformatting
- d) Environmental monitoring
- e) Holdings maintenance
- f) Disaster planning and recovery

- g) Preservation planning []
 h) Other, please, specify
180. Does your institution conduct research relating to conservation and restoration of audiovisual formats? Yes [] No []
 181. If your answer is "Yes", please, provide a brief details

ACCESS TO INFORMATION CONTAINED IN RECORDS AND ARCHIVES

182. Are all your audiovisual materials open to use at present? Yes [] No []
 183. If your answer is "No", please explain why access is limited
184. Are users made aware of their access rights and their responsibility to comply with the policies and regulations of your archival institution? Yes [] No []
 185. Are user's interest and needs analysed at regular intervals, and policies and practices adjusted accordingly? Yes [] No []
 186. Through which of the following are users able to locate descriptions of collections? (Please tick all the applicable options).
 a) Card catalogue []
 b) Word processed registers/inventories []
 c) Printed guide to whole collection []
 d) Computer catalogue accessible in-house []
 e) Computer catalogue accessible remotely []
 (via dial-up modem connection, Telnet, Internet, etc.)
 f) World Wide Web site, please provide URL:
 g) Other, please, specify:
187. What portion of your audiovisual holdings is described in one or more of the finding aids listed in 186, above?
 a) Less than 25% []
 b) 25-49% []
 c) 50-74% []
 d) 75-100% []
 e) Other, please, specify:
188. Are any of the following significant impediments to the use of your audiovisual holdings? (Please tick all the applicable options).
 a) Cannot physically locate them []
 b) Lack of indexes or other finding aids (because holdings have not been processed)[[]
 c) Necessary equipment not available (for example, tape players) []
 e) Records have deteriorated beyond use []
 f) Processing backlog []
 g) Other, please specify
189. Is there a designated reading room provided for consulting your materials onsite? Yes [] No []

190. Estimate the average number of research requests received each year in the following categories:
- f) Regular mail letters
 - g) Electronic mail requests
 - h) In person daily visits
 - i) By telephone calls
 - j) No research requests received []
191. Is there sufficient physical and technical equipment to facilitate easy and safe access to all types of audiovisual materials held? Yes [] No []
192. If your answer is “No”, please give details of the deficiency
193. Are staff providing access fully trained for their jobs? Yes [] No []
194. Are access facilities adequate for the physically challenged (disabled) Yes [] No []
195. Are there established standards governing the quality of service provided by your institution? Yes [] No []
196. Are users aware of their obligation to comply with copyright legislation and access conditions when using information contained in your holdings? Yes [] No []
197. If your answer is “Yes”, please describe the mechanisms used to make them aware
198. Are citation guidelines and processes for permission to publish information from your audiovisual holdings communicated to users? Yes [] No []
199. If “Yes”, please give brief details
200. Are reading room rules and handling guidelines clearly communicated to the users? []
Yes [] No, go to # 202
201. If your answer to question 200 is “Yes”, how are they communicated?
- a) Briefly during use []
 - b) Briefly before use []
 - c) Workshops/ classes []
 - d) Other, please specify
202. Do researchers consult materials under constant supervision by staff? Yes [] No []
203. Are processes for requesting special access to restricted records communicated to users? Yes [] No []
204. Are you using the Internet for giving information about your archive and its contents in a strategic way (that means: with the goal to guide users)? [] Yes [] No, go to question 206.
205. If “Yes”, please state the kind of information you offer
206. Does your description method or description of archives match any generalized standards? [] Yes [] No, go to #208
207. If “Yes”, please state the standards of description that your institution uses
208. Which of the following strategies do you use in your public programming activities (Please tick all the applicable options).
- a) Brochures []
 - b) Exhibitions []
 - c) Electronic media []
 - d) Print media []

- e) Fliers []
- f) Public lectures []
- g) Workshops and seminars []
- h) Publications []
- j) Newsletter []
- k) Other, please specify

209. Do you have a written public programming plan? Yes [] No []

210. Please rank each of the following priorities for improving the management of your audiovisual archives and records and making them available for use: (Please circle one for each: 4=major priority; 3=moderate; 2=minor; 1=not a priority; 0=undecided)

	Major	▶	▶▶	▶▶▶	None
Increase funding	4	3	2	1	0
Increase capacity of storage space	4	3	2	1	0
Improve storage conditions (temperature & humidity controls, security)	4	3	2	1	0
Improve staff training or expertise	4	3	2	1	0
Encourage greater use of collections	4	3	2	1	0
Improve finding aids	4	3	2	1	0
Automate description systems	4	3	2	1	0
Reformat collections (imaging)	4	3	2	1	0
Develop policies/procedures for handling new media	4	3	2	1	0
Preservation/conservation of collections	4	3	2	1	0
Develop disaster plan	4	3	2	1	0
Process backlog of acquired collections	4	3	2	1	0
Increase visibility of or public support for archive programmes	4	3	2	1	0

LEGAL SITUATION RELATED TO THE PRESERVATION OF AUDIOVISUAL RECORDS AND ARCHIVES

211. Is your institution governed by the Archives Act? Yes [] No [] go to question 213.

212. Is "Yes", does it spelt out issues relating to the preservation and access to your audiovisual materials? Yes [] No []

213. If not, what act do you use to fulfil your mandate of preserving and making your audiovisual materials? (Attach copy of the Act if possible)

214. Do you think that your institution has a role in the effective implementation of the Promotion of Access to information Act, 2000? Yes [] No []

215. Please, briefly explain your answer to question 214

216. Have you experienced difficulties in seeking to promote access in terms of the Act? Yes [] No []

217. Please, briefly explain your answer to question 216

218. Please use the space below for any additional comments or concerns related to the management, care, or use of your organization's records and archives

.....
.....
.....
219. I am available to be contacted for further information to advance the purpose of this study
and sharing the results thereof Yes [] No []

Name:
Title
Phone
E-mail

Thank you very much for your time.

Please return the completed questionnaire to Mr Patrick Ngulube, University of Natal, School
of Human and Social Studies, Private Bag X01, Scottsville, 3209, Pietermaritzburg, South
Africa. Telephone: 033 2605972. Fax 033 2605092. E-mail ngulubep@nu.ac.za by 30 October
2002.

Please include copies of the following, if available

Brochures describing your organization and/or its collections

Preservation and other policy documents related to the preservation of your holdings

A self-addressed return envelope has been enclosed for your convenience.

Appendix 8: Observation schedule used at selected archival repositories

1. Observation record

- Observer:.....
- Observer's name:.....
- Observed archival institution's address:.....
.....
- Date/month/year:.....

2. Architecture

- Building construction (wood, brick, concrete)
- Roof Windows, skylights, doors, basement
- Compliance with local codes Cracks, seepage.....

3. Drainage

- Condition of eaves, gutters, downspouts, drains
- Water directed away from building, draining properly

4. Protection from Fire

- Fire extinguishers present, inspected regularly
- Fire suppression and detection systems
- Fire alarm system
- Fire marshal inspections
- Appliance use, conditions

5. Protection from Water

- Pipe leaks, plumbing problems
- Water detectors, sump pumps
- Valuable materials stored above ground
- Staff knowledge/access to water main shut-off, mechanical rooms

6. Heating/Ventilating/Air Conditioning (HVAC) System

7. Access to records by users

Appendix 9: Reminder letter to respondents

Dear Colleague

RE: THE PRESERVATION OF THE ARCHIVAL HERITAGE IN SOUTH AFRICA

On 8 August 2002 I mailed you a questionnaire concerning the preservation of, and access to public records and archives in South Africa. Having failed to get a response by 30 October 2002, I would assume that either you have not received the questionnaire or it was lost. I am therefore, sending under different cover a copy of the questionnaire I sent to you a couple of weeks ago. I hope you will be able to receive it and mail it back to me before 15 December 2002.

Your involvement and cooperation in this survey research is very important. The utility to society of any research results hinges upon the input and/or lack of it by the major stakeholders. As one of the major stakeholders in the preservation of public records in South Africa in general and in your province in particular, you can make a difference to the results of this research by telling me what you are doing well, and the problems you are experiencing if there are any. It is important that your views are included in the study if the research is to adequately portray the full picture of the preservation of public records in South Africa.

In that light, I am kindly requesting you to spare a moment and complete the questionnaire and send it to me by the time of the deadline stated above. Your participation in this survey is key to the success of my project as well as ensuring the validity and applicability of my research findings. Your assistance is greatly appreciated.

Thank you in anticipation of your cooperation.

Yours faithfully,

Patrick Ngulube.

Appendix 10: Basic skills and experience needed for preservationists (conservators)

(Adapted from National Council for Conservation-Restoration (UK) (2001).

- (i) Understanding of health and safety procedures and their implementation (fire precautions; accident procedures and First Aid; types and use of fire extinguishers; dangers of electrical and mechanical equipment; protective clothing and safety equipment; safety principles in the planning and layout of a conservation workshop/laboratory; safe handling, storage and disposal of chemicals; correct use of gas cylinders - storage, transportation and security).
- (ii) The composition and characteristics of archival materials.
- (iii) The nature and cause of damage to archives (i.e. acidity, ultra-violet light, air pollution, micro-biodeterioration, insects, people, rodents, heat and moisture).
- (iv) Testing and evaluating materials (i.e. simple chemical and physical tests for paper, board, textiles and adhesives, accelerated ageing tests).
- (v) The purpose of recording conservation treatment and historical/archival evidence (methods of recording, including photography).
- (vi) Physical and chemical analytical techniques, use of ultra-violet fluorescence, microscopy and pH determination.
- (vii) The principles of archival repair, importance of grain direction and the difference between conservation and restoration.
- (viii) Aqueous and non-aqueous deacidification methods.
- (ix) Fumigation techniques and choice of fumigants.
- (x) Bookbinding: the function of bookbinding (suitability of styles, techniques and materials for archival bookbinding)
- (xi) Microfilming and digitisation
- (xii) The principles and application of the lamination process and the principles and application of encapsulation.
- (xiii) Storage of archives (the location and building structure of the repository, security, fire and flood protection, importance of correct climate, including monitoring of relative humidity and temperature, air conditioning requirements, variety of equipment available for controlling climate, storage requirements of different materials).
- (xiv) Good housekeeping.
- (xv) Knowledge of locally available materials suitable for repairing documents.

Appendix 11: Extracts from the National Archives of South Africa Act, 1996 as amended

Preservation of records

Section 3. OBJECTS AND FUNCTIONS OF NATIONAL ARCHIVES

The objects and functions of the National Archives shall be to-

- a. preserve public and non-public records with enduring value for use by the public and the State;
- c. ensure the proper management and care of all public records;
 - i. generally promote the preservation and use of a national archival heritage.

Section 11. CUSTODY AND PRESERVATION OF RECORDS

1. The Minister may from time to time establish archives repositories under the control of the National Archivist for the custody of records.

2. Public records identified in a disposal authority as having enduring value shall be transferred to an archives repository when they have been in existence for 20 years: Provided that -

- a. no other Act of Parliament requires such records to be kept in the custody of a particular governmental body or person;
- b. the National Archivist may, after consultation with the head of a governmental body, identify such records which -
 - i. should remain in the custody of a governmental body; or
 - ii. should be transferred to an archives repository before they have been in existence for 20 years;
- c. the National Archivist may defer the transfer of any public records; and
- d. the National Archivist may grant permission for any public records to be transferred to an archives repository before they have been in existence for 20 years.

4. The National Archivist shall take such measures as are necessary to preserve and restore records.

Section 13. MANAGEMENT OF PUBLIC RECORDS

1. Subject to the provisions of this Act, the National Archivist shall be charged with the proper management and care of public records in the custody of governmental bodies.

2. Without limiting the generality of subsection (1) -

a. no public record under the control of a governmental body shall be transferred to an archives repository, destroyed, erased or otherwise disposed of without the written authorisation of the National Archivist, issued subject to-

i. section 6(4)(e) of this Act;

b. the National Archivist shall -

i. determine records classification systems to be applied by governmental bodies;

ii. determine the conditions subject to which records may be microfilmed or electronically reproduced; and

iii. determine the conditions subject to which electronic records systems should be managed;

c. the National Archivist shall inspect public records in so far as such inspection may be necessary for the performance of his or her functions under this Act: Provided that the inspection of public records which contain information the disclosure of which is restricted by any other Act of Parliament shall be done only with the consent of the head of the governmental body concerned.

3. The Minister may make regulations as to the management and care of public records in the custody of governmental bodies.

4. The National Archivist may from time to time issue directives and instructions, which shall not be inconsistent with the regulations, as to the management and care of public records in the custody of governmental bodies.

Access to public records

Section 3. OBJECTS AND FUNCTIONS OF NATIONAL ARCHIVES

The objects and functions of the National Archives shall be to-

b. make such records accessible and promote their use by the public;

Section 12. ACCESS AND USE

1. Subject to any other Act of Parliament with access to public records -

a. a public record in the custody of which deals the National Archives shall be available for public access if a period of 20 years has elapsed since the end of the year in which the record came into existence;

b. access to a public record in respect of a period of which a period of less than 20 years has elapsed since the end of the year in which the record came into existence may be given by the National Archivist upon request.

Appendix 12: Extracts from the Promotion of Access to Information Act, 2000

To give effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith.

Part 1: Introductory Provisions

Chapter 3: General Introductory Provisions

Objects of Act

9. The objects of this Act are-

- a) to give effect to the constitutional right of access to-
 - i) any information held by the State; and
 - ii) any information that is held by another person and that is required for the exercise or protection of any rights;
- b) to give effect to that right-
 - i) subject to justifiable limitations, including, but not limited to, limitations aimed at the reasonable protection of privacy, commercial confidentiality and effective, efficient and good governance; and
 - ii) in a manner which balances that right with any other rights, including the rights in the Bill of Rights in Chapter 2 of the Constitution;
- c) to give effect to the constitutional obligations of the State of promoting a human rights culture and social justice, by including public bodies in the definition of “requester”, allowing them, amongst others, to access information from private bodies upon compliance with the four requirements in this Act, including an additional obligation for certain public bodies in certain instances to act in the public interest;
- d) to establish voluntary and mandatory mechanisms or procedures to give effect to that right in a manner which enables persons to obtain access to records of public and private bodies as swiftly, inexpensively and effortlessly as reasonably possible; and
- e) generally, to promote transparency, accountability and effective governance of all public and private bodies by, including, but not limited to, empowering and educating everyone-
 - i) to understand their rights in terms of this Act in order to exercise their rights in relation to public and private bodies;
 - ii) to understand the functions and operation of public bodies; and
 - iii) to effectively scrutinise, and participate in, decision-making by public bodies that affects their rights.

Guide on how to use Act

10. (1) The Human Rights Commission must, within 18 months after the commencement of this section, compile in each official language a guide containing such information, in an easily comprehensible form and manner, as may reasonably be required by a person who wishes to exercise any right contemplated in this Act

Part 2: Access to Records of Public Bodies

Chapter 1: Right of Access, and Specific Application Provisions

Right of access to records of public bodies

11. (1) A requester must be given access to a record of a public body if-

- a) that requester complies with all the procedural requirements in this Act relating to a request for access to that record; and

b) access to that record is not refused in terms of any ground for refusal contemplated in Chapter 4 of this Part.

(2) A request contemplated in subsection (1) includes a request for access to a record containing personal information about the requester.

(3) A requester's right of access contemplated in subsection (1) is, subject to this Act, not affected by-

(a) any reasons the requester gives for requesting access; or

(b) the information officer's belief as to what the requester's reasons are for requesting access.

Chapter 2: Publication and Availability of Certain Records

Manual on functions of, and index of records held by, public body

14.(1) Within six months after the commencement of this section or the coming into existence of a public body, the information officer of the public body concerned must compile in at least three official languages a manual containing-

(a) a description of its structure and functions;

(b) the postal and street address, phone and fax number and, if available, electronic mail address of the information officer of the body and of every deputy information officer of the body appointed in terms of section 17(1);

(c) a description of the guide referred to in section 10, if available, and how to obtain access to it;

(d) sufficient detail to facilitate a request for access to a record of the body, a description of the subjects on which the body holds records and the categories of records held on each subject;

(e) the latest notice, in terms of section 15(2), if any, regarding the categories of records of the body which are available without a person having to request access in terms of this Act;

(f) a description of the services available to members of the public from the body and how to gain access to those services;

(g) a description of any arrangement or provision for a person (other than a public body referred to in paragraph (a) or (b)(i) of the definition of "public body" in section 1) by consultation, making representations or otherwise, to participate in or influence-

(i) the formulation of policy; or

(ii) the exercise of powers or performance of duties, by the body;

(h) a description of all remedies available in respect of an act or a failure to act by the body; and

(i) such other information as may be prescribed.

(2) A public body must, if necessary, update and publish its manual referred to in subsection (1) at intervals of not more than one year.

(3) Each manual must be made available as prescribed.

(4) (a) If the functions of two or more public bodies are closely connected, the Minister may on request or of his or her own accord determine that the two or more bodies compile one manual only.

(b) The public bodies in question must share the cost of the compilation and making available of such manual as the Minister determines.

(5) For security, administrative or financial reasons, the Minister may, on request or of his or her own accord by notice in the Gazette, exempt any public body or category of public bodies from any provision of this section for such period as the Minister thinks fit.

Part 2: Access to Records of Public Bodies

Chapter 3: Manner of Access

Designation of deputy information officers, and delegation

17. (1) For the purposes of public body must, subject to legislation governing the employment of personnel of the public body concerned, designate such number of persons as deputy information officers as are necessary to render the public body as accessible as reasonably possible for requesters of its records.

(2) The information officer of a public body has direction and control over every deputy information officer of that body.

Preservation of records until final decision on request

21. If the information officer of a public body has received a request for access to a record of the body, that information officer must take the steps that are reasonably necessary to preserve the record, without deleting any information contained in it, until the information officer has notified the requester concerned of his or her decision in terms of section 25 and-

(a) the periods for lodging an application with a court or an appeal against a decision of that court have expired; or

(b) that internal appeal, application or appeal against a decision of that court or other legal proceedings in connection with the request has been finally determined, whichever is the later.

Chapter 3: Manner of Access

Access and forms of access

29. (1) If a requester has been given notice in terms of section 25(1) that his or request for access has been granted, that requester must, subject to subsections (3) and (9) and section 31-

(a) if an access fee is payable, upon payment of that fee; or

(b) if no access fee is payable, immediately,

be given access in the applicable forms referred to in subsection (2) as the requester indicated in the request, and in the language contemplated in section 31.

(2) The forms of access to a record in respect of which a request of access has been granted, are the following:

(a) If the record is in written or printed form, by supplying a copy of the record or by making arrangements for the inspection of the record;

(b) if the record is not in written or printed form-

(i) in the case of a record from which visual images or printed transcriptions of those images are capable of being reproduced by means of equipment which is ordinarily available to the public body concerned, by making arrangements to view those images or be supplied with copies or transcriptions of them;

(ii) in the case of a record in which words or information are recorded in such manner that they are capable of being reproduced in the form of sound by equipment which is ordinarily available to the public body concerned-

(aa) by making arrangements to hear those sounds; or

(bb) if the public body is capable of producing a written or printed transcription of those sounds by the use of equipment which is ordinarily available to it, by supplying such a transcription;

(iii) in the case of a record which is held on computer, or in electronic or machine-readable form, and from which the public body concerned is capable of producing a printed copy of-

(aa) the record, or a part of it; or

- (bb) information derived from the record, by using computer equipment and expertise ordinarily available to the public body, by supplying such a copy;
 - (iv) in the case of a record available or capable of being made available in computer readable form, by supplying a copy in that form; or
 - (v) in any other case, by supplying a copy of the record.
- (3) If a requester has requested access in a particular form, access must, subject to section 28, be given in that form, unless to do so would-
- (a) interfere unreasonably with the effective administration of the public body concerned;
 - (b) be detrimental to the preservation of the record; or
 - (c) amount to an infringement of copyright not owned by the State or the public body concerned.
- (4) If a requester has requested access in a particular form and for a reason referred to in subsection (3) access in that form is refused but access is given in another form, the fee charged may not exceed what would have been charged if that requester had been given access in the form requested.
- (5) If a requester with a disability is prevented by that disability from reading, viewing or listening to the record concerned in the form in which it is held by the public body concerned, the information officer of the body must, if that requester so requests, take reasonable steps to make the record available in a form in which it is capable of being read, viewed or heard by the requester.
- (6) If a record is made available in accordance with subsection (5), the requester may not be required to pay an access fee which is more than the fee which he or she would have been required to pay but for the disability.
- (7) If a record is made available in terms of this section to a requester for inspection, viewing or hearing, the requester may make copies of or transcribe the record using the requester's equipment, unless to do so would--
- (a) interfere unreasonably with the effective administration of the public body concerned;
 - (b) be detrimental to the preservation of the record; or
 - (c) amount to an infringement of copyright not owned by the State or the public body concerned.
- (8) If the supply to a requester of a copy of a record is required by this section, the copy must, if so requested, be supplied by posting it to him or her.
- (9) If an internal appeal or an application to a court, as the case may be, is lodged against the granting of a request for access to a record, access to the record may be given only when the decision to grant the request is finally confirmed.

Language of access

31. A requester whose request for access to a record of a public body has been granted must, if the record-

- (a) exists in the language that the requester prefers, be given access in that language; or
- (b) does not exist in the language so preferred or the requester has no preference or has not indicated a preference, be given access in any language the record exists in.

Appendix 13: National Archives and Records Service of South Africa Regulations⁴¹ **(R1458, 2002.11.20)⁴²**

The Minister of Arts, Culture, Science and Technology, under section 18 read with sections 6(3), 6(6), 11(3), 12(4), 13(3) and 13(5) of the National Archives and Record Service of South Africa Act, 1996 (Act No. 43 of 1996), -

(a) has made the regulations in the Schedule;

(b) hereby repeals the Regulations published by Government Notice No. 126 of 24 January 1997.

Part 1: Definitions

1. In these regulations any word or expression to which a meaning has been assigned in the Act, shall have that meaning and, unless the context otherwise indicates -

"Act" means the National Archives Act, 1996 (Act No. 43 of 1996);

"chairperson" means the chairperson of the Council;

"committee" means a committee of the Council appointed in terms of Section 6(5) of the Act;

"head of an archives repository" means the chief executive officer of an archives repository or the person who is acting as such;

"strongroom" means a room or place in an archives repository where records are stored;

"the Act" means the National Archives and Record Service of South Africa Act, 1996 (Act No. 43 of 1996).

"transfer" means the transfer of public records from a governmental body to an archives repository in terms of section 11(2) and 13(2)(a) of the Act;

"user" means a member of the public consulting records in an archives repository.

Part 2: Transfer of public records

2. The transfer of public records may take place on the initiative of either the National Archivist or the head of the governmental body under whose control those records fall.

3. The National Archives may enter into an agreement with the head of a governmental body for the planned and systematic transfer of public records.

4. When a governmental body wishes to transfer public records, the head of such a body shall submit a written request to do so to the head of the archives repository concerned, subject to the following conditions:

(a) Where such records are covered by a disposal authority, this request must include—

(i) a duplicate transfer list of such records in which each item is identified by reference number, description and opening and closing dates; and

(ii) an indication of the extent of such records in linear metres; and

(b) where such records are not covered by a disposal authority, this request must include —

(i) a summarised identification of such records by type, period and office of origin;

(ii) an indication of the nature of the records classification system, whether such system was approved by the National Archivist, and whether such system is still in use; and

(iii) an indication of the extent of such records in linear metres.

⁴¹ Part of the regulations were published in the *Government Gazette* No. 24085 of 20 November 2002.

⁴² Some relevant sections of the old regulations were incorporated into the current regulations.

5. A governmental body may transfer public records to an archives repository only after receiving written authorisation to do so from the National Archivist. A written authorisation referred to in section 13(2)(a) of the Act may provide specific instructions to be followed by the governmental body.
6. In addition to any special conditions which may apply to any transfer—
 - (a) the public records concerned shall be deposited in the archives repository determined by the National Archivist;
 - (b) the public records concerned must be ordered precisely in accordance with the transfer list contemplated in regulation 4(a)(i);
 - (c) containers or packages used for the transfer must be clearly labelled in the sequence determined by the transfer list; and
 - (d) receipt of the transfer shall be acknowledged by the despatch to the governmental body concerned of an endorsed copy of the transfer list.
7. Subject to such conditions as the head of an archives repository may determine, public records in the custody of the National Archives may be returned temporarily to the governmental body, or such body's legal successor, which transferred them to the National Archives: Provided that those records shall be returned to the archives repository concerned within 60 days of receipt, unless the head of that repository has authorised an extended period in writing.
8. All costs relating to the transfer and temporary return of public records as provided for in regulations 2 to 7 shall be borne by the governmental body transferring the records to or borrowing the records from the National Archives.

Part 3: Access and use

9. Consultation of records in an archives repository shall take place in the reading rooms of that repository.
10. Any member of the public may be admitted to the strong rooms of an archives repository with the approval of the head of such repository and subject to the conditions laid down by such head.
11. Any member of the public admitted to a strong room or other place in an archives repository where records are stored or processed shall not eat, drink, smoke, strike a match, use a lighter, or carry any bag, receptacle or any other container.
12. The head of an archives repository may require a user to—
 - (a) present his or her identity document or passport;
 - (b) record in the repository's user register—
 - (i) the subject of his or her research;
 - (ii) the purpose of the research;
 - (iii) his or her permanent residential address;
 - (iv) such other information as the head of the archives repository may require;
 - (c) notify the head of any subsequent changes to the information contemplated in paragraph (b);
 - (d) sign the repository's user register.
13. (1) The head of an archives repository may deny a user access to a reading room—
 - (a) if such person contravenes these regulations; or
 - (b) on account of that user's persistent improper conduct.
 (2) Such denial of access must be reported in writing to the National Archivist as soon as possible.

14. Reading rooms of archives repositories shall be open to users at such times as the National Archivist may determine.
15. A user shall write and sign his or her name in a register provided for the purpose every day on which records are consulted.
16. A user shall request the delivery of records to a reading room for consultation in writing using a form, following a procedure, and at times prescribed by the National Archivist.
17. The head of an archives repository shall determine the number of records which may be consulted simultaneously by a user.
18. (1) When consulting records a user shall observe all instructions pertaining to the handling of records laid down by the head of an archives repository.
- (2) Without limiting the generality of subregulation (1)—
- (a) the greatest care in handling records shall at all times be exercised;
 - (b) the order of records shall not be disturbed;
 - (c) any damage to a record or disturbance in the order of records caused or discovered by a user shall be reported to the reading room supervisor;
 - (d) writing or making of any mark on any record is prohibited;
 - (e) the use of fountain pens is prohibited;
 - (f) no bags, receptacles or containers of any kind may be retained in a reading room.
19. The head of an archives repository may prohibit the copying of a record if such copying might damage the record.
20. The head of an archives repository may limit the length of time for which a user may utilise a copying machine, computer terminal or other facility provided by that repository.
21. The head of an archives repository may provide members of the public with copies of records, provided that the head may impose a limit on the number of copies.
22. Members of the public shall pay for any copies of records made in an archives repository according to the tariffs determined by the Treasury.

Part 4: Management of records

23. The head of a governmental body is responsible for ensuring that all records of such body—
- (a) receive appropriate physical care;
 - (b) are protected by appropriate security measures; and
 - (c) are managed in terms of standing orders of that body.
24. The head of a governmental body shall supply the National Archivist with such information related to the management of records under his or her control as the National Archivist may require.
25. The head of a governmental body shall comply with all directives and instructions issued by the National Archivist and pertaining to the management and care of public records.
26. The appraisal of the records of a governmental body may take place on the initiative of either the National Archivist or the head of the governmental body concerned. In either case, the transfer to an archives repository, destruction or other disposal of such records shall be effected in terms of a disposal authority.
27. Procedures for the issuing of disposal authority shall be prescribed by the National Archivist in directives and instructions.
28. The preparation of records for destruction in terms of a disposal authority shall be done under the supervision of the records manager of the governmental body concerned.
29. Whenever records are destroyed in terms of a disposal authority, the head of a governmental body shall submit to the National Archivist a certificate of destruction as

prescribed by the National Archivist, unless an exemption from this obligation has been received from the National Archivist.

30. The head of a governmental body shall report to the National Archivist without delay all cases of serious damage, loss or unauthorised destruction of that body's records.

31. (1) No governmental body shall use a records classification system unless it has been approved by the National Archivist.

(2) Any application for the approval of a records classification system shall follow procedures prescribed by the National Archivist.

32. Any revision or addition to an approved records classification system shall be submitted to the National Archivist for approval in accordance with procedures prescribed by the National Archivist.

33. The head of a governmental body shall report to the National Archivist such body's intention to microfilm records or to introduce an electronic records system and such notification shall follow procedures prescribed by the National Archivist.

34. The official designated as the records manager of a governmental body in terms of section 13(5) of the Act shall—

(a) be in possession of an appropriate university or technikon qualification, or have appropriate professional experience;

(b) have successfully completed the National Archives' Records Management Course;

(c) possess a thorough knowledge of the body's organisational structure; and

(d) be responsible for promoting the effective, efficient and accountable management of the body's records and ensuring, by inspection and other means, the body's compliance with the Act and all other relevant legislation.

Part 5: Council

35. (1) The Minister shall appoint members of the Council through a process of public nomination.

(2) (a) The Minister shall, by notice in the gazette and at least two newspapers circulating throughout the Republic, request nominations of suitably qualified persons.

1 Published in the *Government Gazette* No. 24085 of 20 November 2002.

(b) The notice referred to in paragraph (a) shall specify the qualifying requirements for the appointment, as well as the manner, place and time within which the nomination must be submitted.

(3) In appointing a member of the Council from the nominees, the Minister shall ensure that:

(a) the member has the necessary experience and that stakeholder interests are taken into account; and

(b) the Council reflects to a reasonable degree the demographic and gender realities of the Republic of South Africa.

36. (1) A term of office of a member of the Council shall be a period of three years.

(2) Any person whose term of office as a member of the Council has expired may be reappointed for one additional term.

(3) A person appointed in the place of a member who has vacated office, shall hold office for the unexpired term of office of the member in whose place he/she is appointed.

(4) The term of office contemplated in subregulation (3) shall not be considered as a term of office for the purposes or re-appointment under subregulation (2).

37. The Minister may remove a member of the Council from office if-

(1) the member is absent from two consecutive ordinary meetings of the Council without leave of such absence having been granted by the Council;

- (2) such removal is requested by at least two thirds of the other members of the Council;
- (3) The member is found to be of unsound mind by a competent court; or
- (4) The member is found guilty of misconduct.
38. (1) The Minister shall appoint the chairperson and the Council shall elect from among its members a deputy chairperson.
- (2) The deputy chairperson shall perform all the functions of the chairperson in the absence of the chairperson.
- (3) Whenever both the chairperson and the deputy chairperson are not available, the members must, from among themselves, elect a member to act as chairperson.
39. (1) Ordinary meetings of the Council shall be held at least twice a year.
- (2) Special meetings of the Council shall be held:
- (a) by order of the Minister; or
- (b) on a written request signed by at least half of the members of the Council.
- (3) The chairperson shall determine the venue, date and time of ordinary and special meetings.
- (4) The secretary shall dispatch the agenda of an ordinary meeting of the Council at least six weeks prior to the date of the meeting to all members of the Council.
- (5) The secretary shall dispatch the agenda of a special meeting of the Council at least two weeks prior to the date of such meeting.
- (6) A quorum for a meeting of the Council shall be the majority of its members.
- (7) If there is no quorum at a meeting the meeting must be postponed for at least two weeks: The members at the second meeting shall form a quorum for that meeting.
- (8) A decision of the majority of the members present at any meeting constitutes a decision of the Council and, in the event of an equality of votes, the presiding member shall have a casting vote in addition to his or her deliberative vote.
- (9) No decision of Council shall be invalid merely by reason of a casual vacancy in the Council.
- (10) The secretary shall record the minutes of every meeting of the Council, and shall circulate the draft minutes among members.
- (11) Minutes of the proceedings of each meeting shall be submitted at the next meeting of the Council and, if passed as correct, shall be confirmed by the signatures of the chairperson and the secretary.
40. (1) A committee of the Council shall elect a chairperson and, if necessary, a secretary for that committee from among its members.
- (2) The chairperson of a committee shall:
- (a) determine the venue, date and time of a meeting of that committee;
- (b) table minutes of any meeting held by that committee since the last meeting of the Council at the next ordinary meeting of the Council; and
- (c) provide a written report of the activities of the committee at the Council meeting.

Appendix 14: Selected standards applicable to the preservation of records and archives

International standards

- ICA: 1994- General international standard archival description: ISAD(G)
ICA: 1996- International archival authority record for corporate bodies, persons and families: ISAAR (CPF)
ISO / DIS 11799 Document storage requirements for archive and library materials.
ISO / WD 16245 Archives boxes and file covers for paper documents.
ISO 417 Photography- Determination of residual thiosulfate and other related chemicals in processed photographic materials. Methods using iodine-amylose, methylene blue and silver sulfide.
ISO 543 Cinematography- Motion picture safety film - Definition, testing and marking
ISO 3897 Photography- Processed photographic plates- Storage practices.
ISO 4331 Photography- Processed photographic black and white film for archival records – Silver-gelatin type on cellulose ester base- Specifications
ISO 4332 Photography- Processed photographic black and white film for archival records- Silver-gelatin type on poly(ethylene terephthalate) base- Specifications
ISO 5466 Photography- Processed safety photographic films- Storage practices
ISO 6051 Photography- Processed reflection prints - Storage practices.
ISO 6200 Micrographics- First generation silver gelatin microforms of source documents - Density specifications.
ISO 7830 Photography- Safety photographic films other than motion picture films- Material specifications.
ISO 8126 Micrographics - Diazo and vesicular films- Visual density- Specifications
ISO 9718 Photography- Processed vesicular photographic film- Specifications for density
ISO 10214 Photography- Processed photographic materials - Filing enclosure for storage
ISO 10602 Photography- Processed silver-gelatine type black and white film- Specifications for stability.
ISO / DIS 11799 Document storage requirements for library and archive materials.
ISO / DIS 11798 Permanence and durability of writing, printing and copying on paper - Requirements and testing methods.
ISO / DIS 14416 Requirements for binding of books, periodicals, serials and other paper documents for library and archive use- Methods and materials.
ISO / CD 15659 Standardization of permanent and durable boards used for bookbinding and document storage purposes.
ISO 9706 : 1994 Information and documentation - Paper for documents- Requirements for permanence.
ISO 11108: 1996 Information and documentation- Paper for archival documents.
ISO 11800 : 1998 Information and documentation- Requirements for materials and methods for bookbinding.

South African national standards

- SABS 0141:1988 - The processing, testing and storage of silver-gelatin microfilm for archival purposes
ARP 025:1998 - Guidance on the implementation of the requirements and the development of quality documentation in accordance with SABS ISO 9001:1994 or SABS ISO 9002:1994
SABS 1015:1974- Fire resisting door units for record rooms
CKS 482:1977- Duplicator paper (groundwood grade)

Appendix 15: Planning activities in the preservation of archival materials

Preservation Plan (Garlick 1990:259; Ritzenthaler 1993: 6-9; Ward 2000:54)

Formation of the committee responsible for planning the programme

Drafting of the preservation goals statement

Approval of the policy statement by management

Gathering data on existing preservation activities

Gathering of data on preservation needs (building, environment, formats, condition of materials, archival procedures and policies)

Draft reports at regular intervals to keep staff informed of the progress of the preservation programme

Final statement of findings and recommendations

Establish priorities and goals

Approval of the preservation policy

Reorganising staff and functional responsibilities

Writing job descriptions

Hiring new staff

Developing written guidelines, procedures and standards

Staff training and orientation

Selecting and organizing individual holdings maintenance programmes (storage and housing, environmental control, reformatting)

Appendix 16: Simplified deacidification procedure

I. Required materials

Calcium chloride (CaCl_2) solution (saturated); sodium carbonate (Na_2CO_3) solution (saturated); 3 shallow trays or pans; acidic paper (several numbered samples) and pH pens

II. Procedure

- Test paper samples with pH pen. Record the pH as well as the number of each sample.
- Choose one of the samples that tests acidic and weigh on centigram balance. Record sample number and mass.
- Submerge the paper sample in the shallow pan filled with calcium chloride solution until it is completely soaked through. Carefully remove and dry. You may use a hair dryer or blower but **no heat**.
- Place the dried paper sample into a shallow pan filled with sodium carbonate solution and allow to react completely (5-10 minutes). Remove carefully and dry. Again you may mechanically dry with **no heat**.
- Thoroughly wash the paper with water. This will require several washings.
- Dry paper and weigh on centigram balance.
- Test paper with pH pen. Record pH.
- Determine the % calcium carbonate in the deacidified sample.

III. Data

Sample # 1 2 3 4 5

pH _____

Acid sample # _____

pH before treatment _____

pH after treatment _____

mass before treatment _____ g

mass after treatment _____ g

mass of calcium carbonate filler added _____ g

IV. Calculations

% CaCO_3 filler = mass of CaCO_3 x100 (mass of deacidified paper)

V. Hazards

The sodium carbonate solution may dry hands so gloves should be worn. Eye protection is ALWAYS required.